June 24, 2011
Submitted to Delta Stewardship Council. General comments regarding the background science used to develop the Draft Delta Plan, including the 4th Staff Draft.

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This comment paper is submitted to challenge specific and important physical characteristics of the "science" referenced in support of the proposed new Delta Plan, currently in the 4th Staff Draft stage. It has often been said at DSC and BDCP meetings that agencies are using "Best available science". "Best available science" when proved wrong is bad science. Bad science, applied, results in bad outcomes. It is financially, legally and socially irresponsible for any scientist, politician or government agency to make important decisions regarding the future of Delta lands, waterways, people and water rights based upon bad science. Basing decisions on bad science also exposes the taxpayers of California to increased taxation to cover the costs of litigation and punitive awards to the harmed landowners when the state (or federal government) intentionally moves forward with changes to Delta islands and water flow based on *known* bad science.

This paper specifically asks four series of questions which directly impacts the new Delta Plan, and requests that the appropriate agency representative investigate and resolve the data conflict or issue presented *prior to final approval of any revised Delta Plan.* The research and document giving cause to ask the questions are provided as follows:

A. **Salad-bar science:** The historical island data used for the DRMS Phase 1 Final Report (2008) and its two revisions (3/2009 and 12/2009), have been shown to be false and inaccurate, yet the data continues to be used or quoted in most BDCP documents. DRMS Phase 2 Report has been released, and some of the DRMS Phase 2 decisions build upon and are based on incorrect Delta island history. **Question series for California Resources Agency**: Why is DWR continuing to use false data regarding individual island flood and seismic history, exemplified in DRMS Phase 1 and 2 reports? Why did DWR combine flood, seismic and soil data for two different Ryer Islands into the DRMS report, and is DWR aware that DRMS is incorrect regarding several other Delta islands as well? Why did the DCC gate log (USBR engineer) show the Jones Tract levee failure on June 1, 2004 while DWR reported the levee failure on June 3, 2004? (See documentation-Section A)

B. **It depends on who's counting**: When computing water flow and velocity for reports comparing past and current water flow in the Delta, I found formula conflicts between conversion tables used by DWR and USGS, dating back to 2000 and 2001. If the conversion table from DWR was used for the initial raw data and formula input for CALSIM modeling, wouldn't this explain one reason why CALSIM II modeling doesn't match actual water flow calculations for some studies? If an individual wanted to independently calculate actual

Sacramento River historical inflow, exports and outflow to compare with proposed outflow after all the Sacramento River diversion-construction projects are up and running, (Freeport pumps, Yolo Bypass diversion, DCC reoperation, Stockton siphon-diversion, etc) it would require conversions between CFS, MGD, KAF, TAF and other measures of water volume and velocity. **Question for DWR and USGS**: Which conversion table is correct: DWR or USGS? How much fresh water, (volume) at a minimum, will continue to flow on the Sacramento River and its tributaries between the cities of Sacramento and Rio Vista, including Steamboat Slough, Sutter Slough, Miners Slough? What is the expected velocity of water flow on Steamboat Slough, at Snug Harbor peninsula, each month of the year? (See documentation and links-Section B)

C. **What's Where When or 101 Wrong Maps of the Delta: The "Flooded Islands Pre-feasibility Studies and DRMS Reports Phase 1 and 2.** Several different important Delta-related studies and agencies confuse the islands and waterways of the Delta. DRMS Phase 2 suggestion for "pre-flooded islands" is based on 2005 modeling which appears to have substantially confused the names and/or locations of Delta islands, which now puts into question the veracity of any "pre-flooded island" studies based on the original 2005 modeling report. It is assumed the DSC will be asked to approve the "pre-flooding" of some Delta Islands. Before any approvals are made, the pre-flooding studies should be independently reviewed with close attention to the inaccurate historical data used, the confusion of the Delta island locations in the "base study" and the true economic impacts to Delta landowners, businesses and counties, which were also inaccurately reported in DRMS Phase 1 and 2. **Question for BDCP**: If the scientists or government contractors for the BDCP can't even come up with accurate maps of the Delta, why should their study results be accurate or trusted? (See documentation and links-Section C)

D. **CalFed construction projects related to the 2000 *conveyance* portion of the plan have continued to be built as "regional projects".** It appears that as of June 2011 most of the conveyance elements of the CalFed 2000 ROD "preferred alternative" are complete or almost complete, without approval by the DSC. **Question for BDCP or DWR:** Is it expected the central conveyance or "preferred alternative" which includes reoperation of the DCC, expanded capacity of Freeport pumps, revision to McCormack/Williamson Tract, dredging around the area of DCC and Dead Horse island to facilitate greater water flow down the Mokelumne Rivers, Stockton siphon, etc will be operational by the end of 2012 or earlier, and will the DSC be asked for approval for the remaining portions of construction even though those regional projects completed their eir/eis processes in past years? Will approval include use of Staten Island for In-Delta water "detention", McDonald or Bacon Island, or other Delta islands and if so, which islands are planned to be IDS? (See links-Section D)

Please note that the following pages will provide links to documents found online at the time of researching this paper.

(continued next page)

A **Salad-bar science:** The historical island data used for the DRMS Phase 1 Final Report (2008) and its two revisions (3/2009 and 12/2009), and portions of DRMS Phase 2 have been shown to be false and inaccurate, yet the data continues to be used or quoted in most BDCP documents, and the data is used to validate the proposed Draft Delta Plan.

Question for California Resources Agency: Why is DWR continuing to use false data regarding individual island flood and seismic history, exemplified in DRMS Phase 1 and 2 reports? Why did DWR combine flood, seismic and soil data for two different Ryer Islands into the DRMS report, and is DWR aware that DRMS is incorrect regarding several other Delta islands as well? Why did the DCC gate log (USBR engineer) show the Jones Tract levee failure on June 1, 2004 while DWR reported the levee failure on June 3, 2004?

Summary, documents and links: Beginning 2001 it seems there was a transition to use of Salad-bar Science. *A Salad-bar Scientist is someone (or a group of persons) who pick out bits and pieces of other reports and data on a particular topic, to combine the incomplete data as proof of a predetermined desired outcome.* The Delta Risk Management Strategy (DRMS) 2008 Final Phase 1 published 2008[1], and the subsequent revisions March 2009 and December 2009[2] , and lately DRMS Phase 2, are a perfect example of the application of salad-bar science. Review of the historical process of the DRMS report(s) shows the following steps:

First, the DRMS funder (DWR) determined outcome desired-a technical report of Delta island failure history which would create the impression of immediate danger. i.e support the concept that "Delta islands are on the verge of failure based on historical records", even though historical records show a marked decline in failures.

Second, the DRMS contractor (URS) along with the DRMS funder proceeded to pick and choose illogical time frames for fabricated historical data, and even included records from areas not within the physical location of the Delta perhaps to inflate the "flood" records to negatively affect means and averages.

Third, the DRMS authors inconsistently applied and reported the data so that anyone attempting to review the data would not be able to duplicate the findings and therefore have difficulty challenging the report without recompilation of historical data independently.

However, the DRMS report(s) was and continues to be challenged in many ways, which is the natural outcome of salad-bar science. It's bad science.

Specifically, the DRMS reported that Delta Islands had flooded 158 times in the last 100 years[3]. The last comprehensive Delta flood study, reported by USACE, reported 36 floods since the Delta islands were leveed[4]. How would two government agencies come up with such different numbers? DWR/URS came up with the false and inflated flood number by (1) counting islands floods from a

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[1] http://www.science.calwater.ca.gov/drms/drms_irp.html website now says 'archived" See flood risk sections
[2] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/phase1_information.cfm Corrected regarding Ryer Island flood history only
[3] http://www.science.calwater.ca.gov/pdf/drms/DRMS_Risk_Report_section_01_071008.pdf look at section 2, 7.
[4] http://www.spk.usace.army.mil/organizations/cespk-pao/delta/delta_reports/Plate%201%20Delta%20Flooding%20Map.pdf complete report: http://www.spk.usace.army.mil/projects/civil/Delta/Docs.html

time before levees were even built[5]; (2) counting islands not located in the legal Delta as if they were in the Delta[6]; (3) counting intentional or controlled flooding of islands as if they were accidental floods[7]; (4) inconsistently adding incidents of controlled flooding[8]; (5) fabricating flood history for target areas of the Delta[9]; (6) confusing the locations of Delta islands by applying flood history to alternate islands[10]; and (7) fabricating a "flood" incident in 2004[11] as if it was an accidental occurrence instead of a field study for In-Delta storage proposals. Please see the timeline IDS study[12] for details.

What is important to note is that is that northern and central Delta islands have ***not*** accidentally flooded since the record water flows of the 1980's, even though there have been very wet rain years and a major earthquake in the Bay Area since the last accidental island flood. For example, the timelines below represent accidental and/or intentional Delta island failure from flood and from seismic event and are provided to graphically demonstrate the truth, that historically Delta island flood risk is declining, not increasing. In other words, USACE, USBR and the Delta Reclamation Districts have been doing their job to protect Delta lands from accidental floods. Lets start with a look at the DWR 1975 Delta historical flood map:

(go to next page)

[5] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/Risk_Report_Section_13_Final.pdf Uses period from 1900 to 2000 but the current levee system was not improve to current standards until 1930's.
http://www.science.calwater.ca.gov/pdf/drms/DRMS_Risk_Report_section_02_062608.pdf Maps at the end reflect incorrect historical data.

[6] http://www.science.calwater.ca.gov/pdf/drms/DRMS_Risk_Report_section_13_071008.pdf See page 23; and see maps for reference: http://www.delta.ca.gov/res/docs/map/Black_and_White_Map.pdf Legal Delta Region island names (no Suisun Marsh) See also http://www.delta.ca.gov/res/docs/map/delta.pdf and DRMS includes Suisun Marsh http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/RiskAnalysis_ITF.pdf see page 9. http://www.delta.ca.gov/res/docs/Sacto-SanJoaqin_fact.pdf "Delta Facts" includes Suisun Marsh area.

[7] http://www.deltarevision.com/2011/historic-timeline/historic_maps/1975_delta-floods-dwr.pdf see map of "controlled flooding" islands

[8] http://www.deltarevision.com/2011/historic-timeline/historic_maps/1975_delta-floods-dwr.pdf same document but make note of Yolo Bypass area

[9] http://ryerisland.com/DRMS_wrong_on_ryer_island.htm

[10] http://ryerisland.com/Ryer_maps.htm

[11] http://deltarevision.com/Jones_Tract.htm

[12] http://deltarevision.com/2011/Bacon_Island_Jones_Tract_field_studies.pdf

STATE OF CALIFORNIA
The Resources Agency
Department of Water Resources

BULLETIN No. 192

PLAN FOR IMPROVEMENT OF THE DELTA LEVEES

MAY 1975

CLAIRE T. DEDRICK
Secretary for Resources
The Resources Agency

EDMUND G. BROWN JR.
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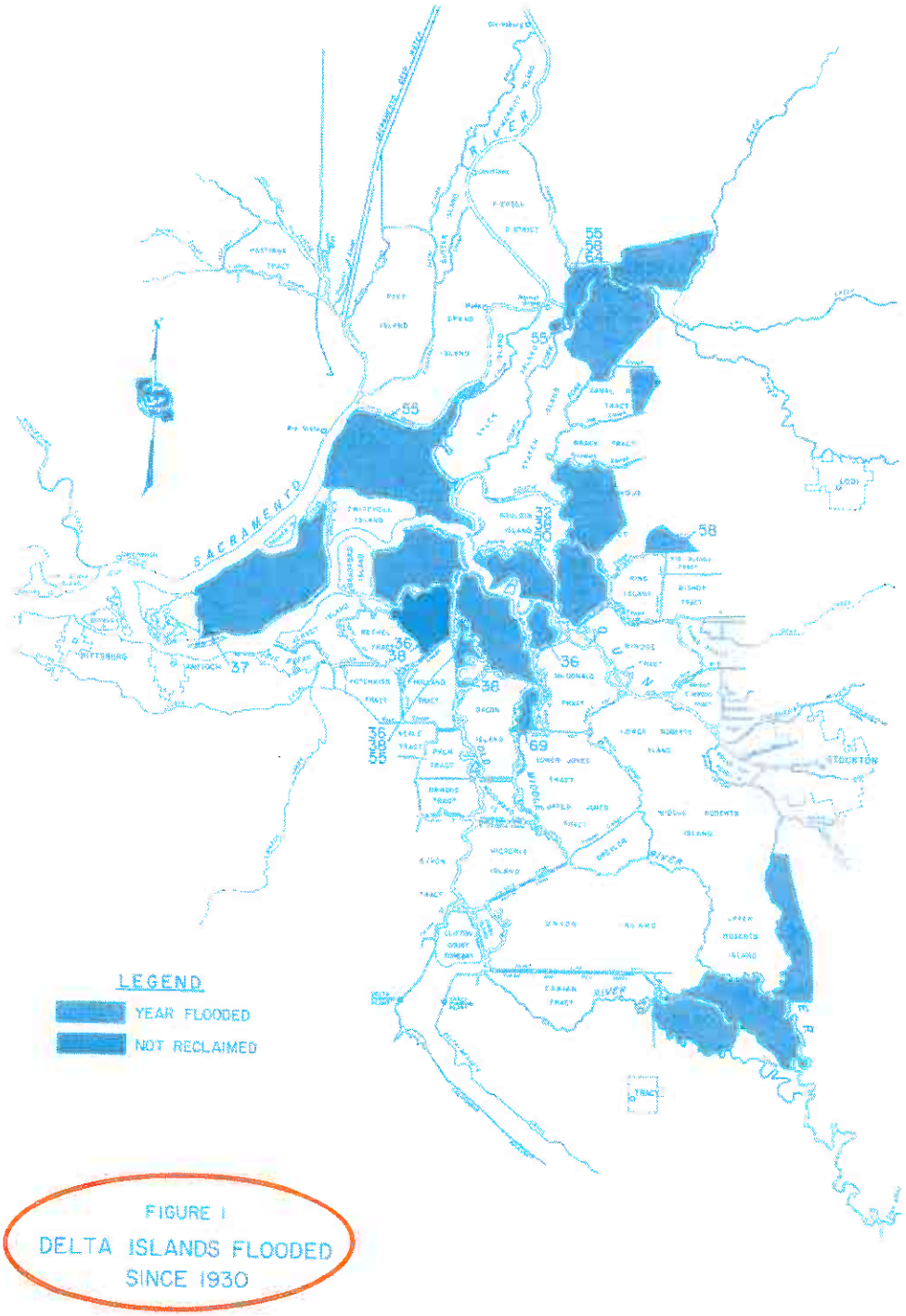
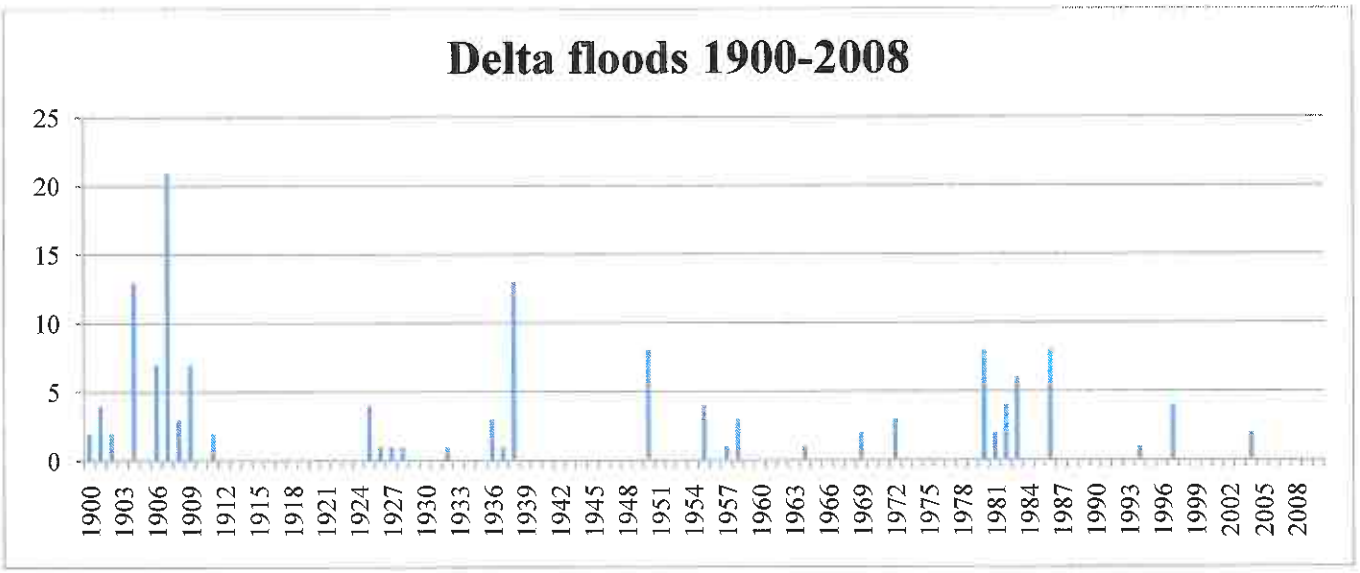


FIGURE 1
DELTA ISLANDS FLOODED
SINCE 1930

The map above is from the 1975 DWR Plan for Improvement of the Delta levees, and reflects Delta flood incidents from 1930 to 1975, again showing that in prior DWR Delta reports, where factual data and author integrity was important, flood records prior to 1930, although known, were not appropriate to use.

The timelines below are based on reports and materials provided by Department of Water Resources published in 1975[13], 1987[14], 2005[15], 2007[16], and reports and documents provided by Department of Interior, USBR, or US Army Corps of Engineers dated 1980, 1999 and 2006[17]. The *totals were summarized* in a spreadsheet.[18]

Figure 1: Timeline of Historical Floods in Delta, *both accidental and intended "controlled" floods.*



*As the above timeline shows, the vast majority of flood events in the Delta occurred **prior to** the first USACE official series of levee improvements started after the floods of low Delta levees 1900 to 1909.. In fact, 86 islands flooded prior to 1930, and since the islands levees were not improved prior to 1930 it is intentionally misleading to use flood incidents from a time when the levees did not exist! In other words, DWR's claim of 158 floods should be reduced by 86 to "72" based on this fact alone.*

In fact, prior to 2004, DWR, USBR and other government agencies consistently reported Delta flood incidents in two time periods: 1930 to 1966 and 1967 to the present, or 1930 to the year of the report publication. This is because levees were improved between 1930 and 1966 for the Federal & State water projects, and later received more improvements as part of the state water projects of the late 1970s and beyond.

The two tables below clearly show the decline of flood incidents as levees are improved and Delta water inflows become more and more managed by the joint operation of DWR and USBR.

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[13] http://www.deltarevision.com/2011/historic-timeline/historic_maps/1975_delta-floods-dwr.pdf see map of "controlled flooding" islands

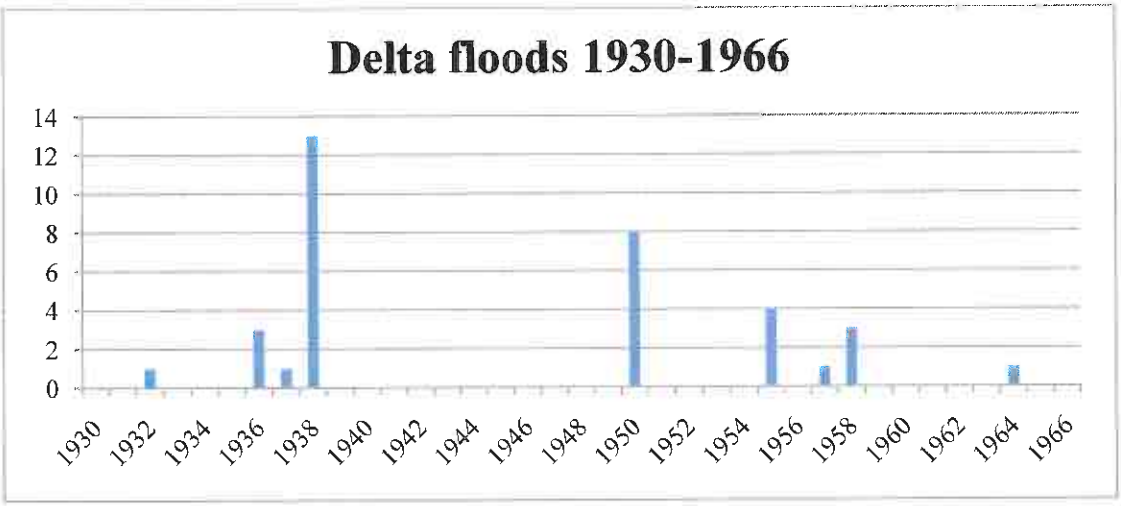
[14] http://deltarevision.com/1848-1989_docs/1986-tyler_island_flood.pdf

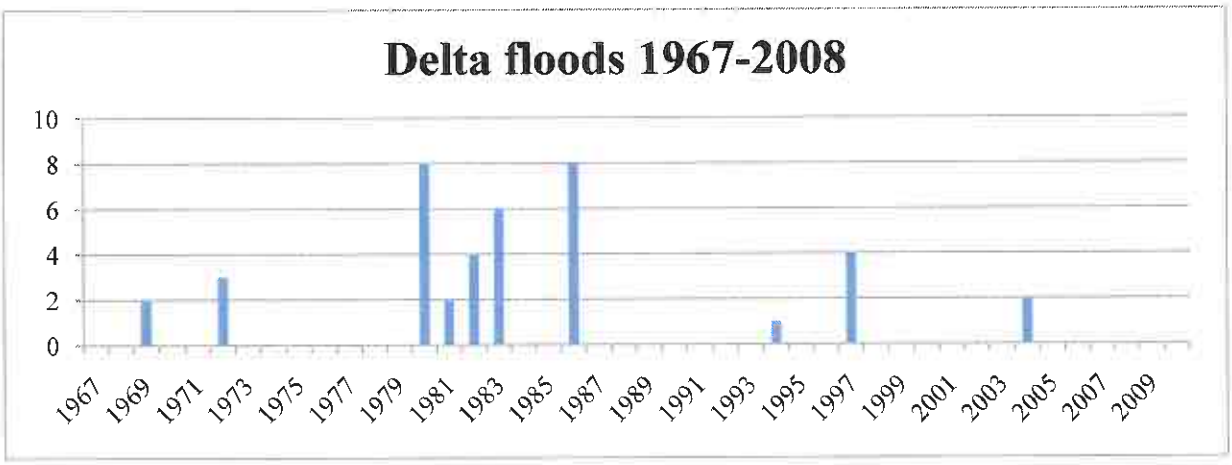
[15] http://www.waterplan.water.ca.gov/docs/cwpu2005/Vol_1/v1PRD.combined.pdf page 187

[16] http://baydeltaoffice.water.ca.gov/sdb/tbp/deltaoverview/delta_overview.pdf

[17] http://www.spk.usace.army.mil/organizations/cespk-pao/delta/delta_reports/Plate%202%20Regional%20Map.pdf and full report at http://www.spk.usace.army.mil/projects/civil/Delta/Docs.html http://www.spk.usace.army.mil/organizations/cespk-pao/delta/index.html for more details

[18] http://ryerisland.com/images/floods/delta_floods_final.pdf graphs at http://deltarevision.com/2011/historic-timeline/historic_maps/timeline_delta_levee_failures.pdf





The wettest years of record generally correlate to a Delta flood incident prior to 1990.. It is interesting to note that the businesses and farmers outside the Delta, who have very strong political ties, were pushing for passage of the Peripheral Canal plan from approximately 1978 to the vote of 1982. Allowing flooding of Delta islands was as politically opportune in 1980-1983 as it was in 2004 for the Jones Tract "sunny day" flood.

Another way that DWR is currently intentionally misleading viewers regarding Delta flood history to list intended, planned or control floods as if they were accidental floods. According to DWR in their 1975 publications[19], several islands are managed for "flood control" meaning the island is intentionally flooded for to relieve water pressure or flow to a different island or waterway in the Delta. McCormack/Williamson Tract and all of the Yolo Bypass area have been intentionally flooded for water management purposes.

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[19] http://www.deltarevision.com/2011/historic-timeline/historic_maps/1975_delta-floods-dwr.pdf see map of "controlled flooding" islands

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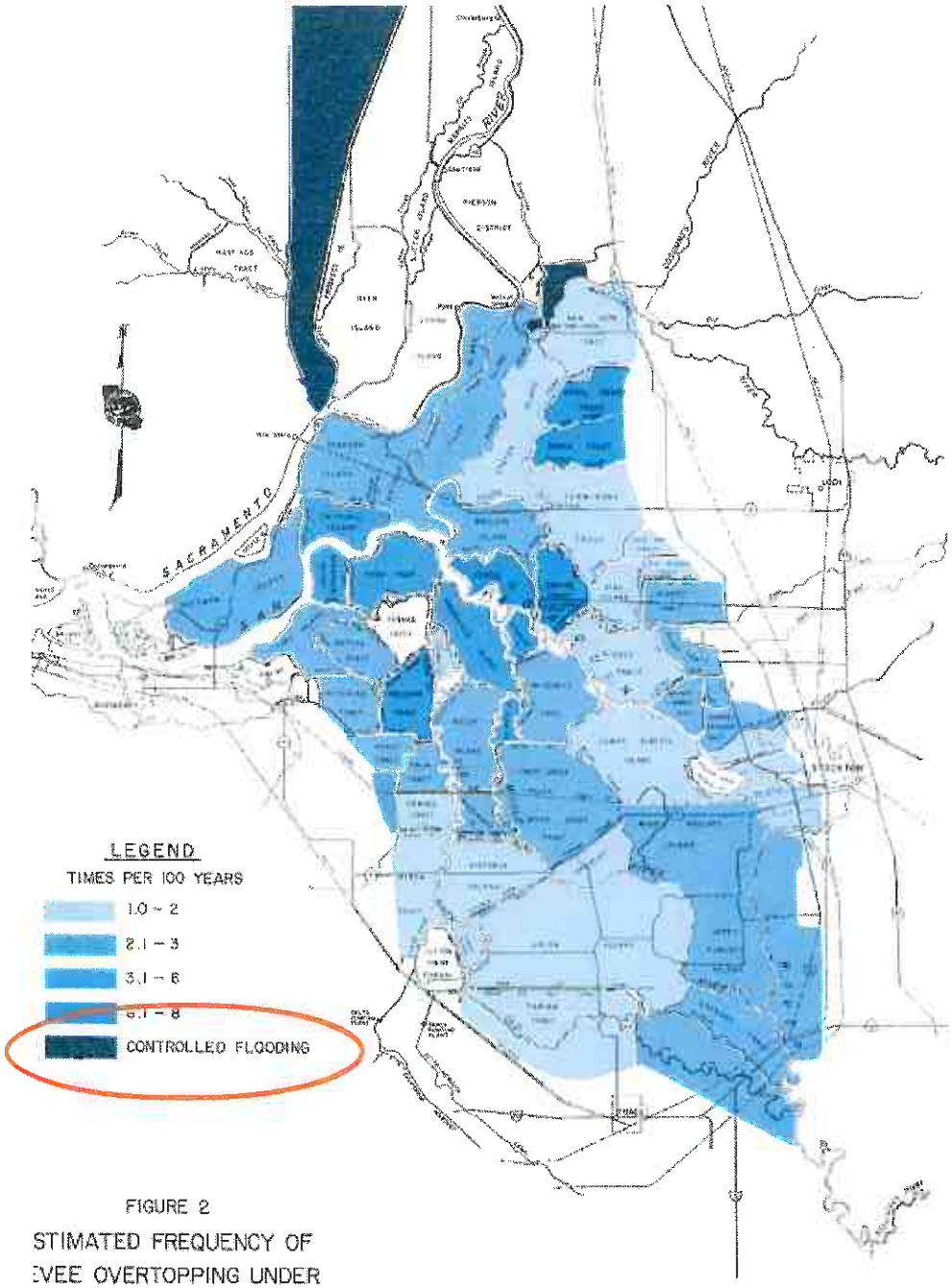
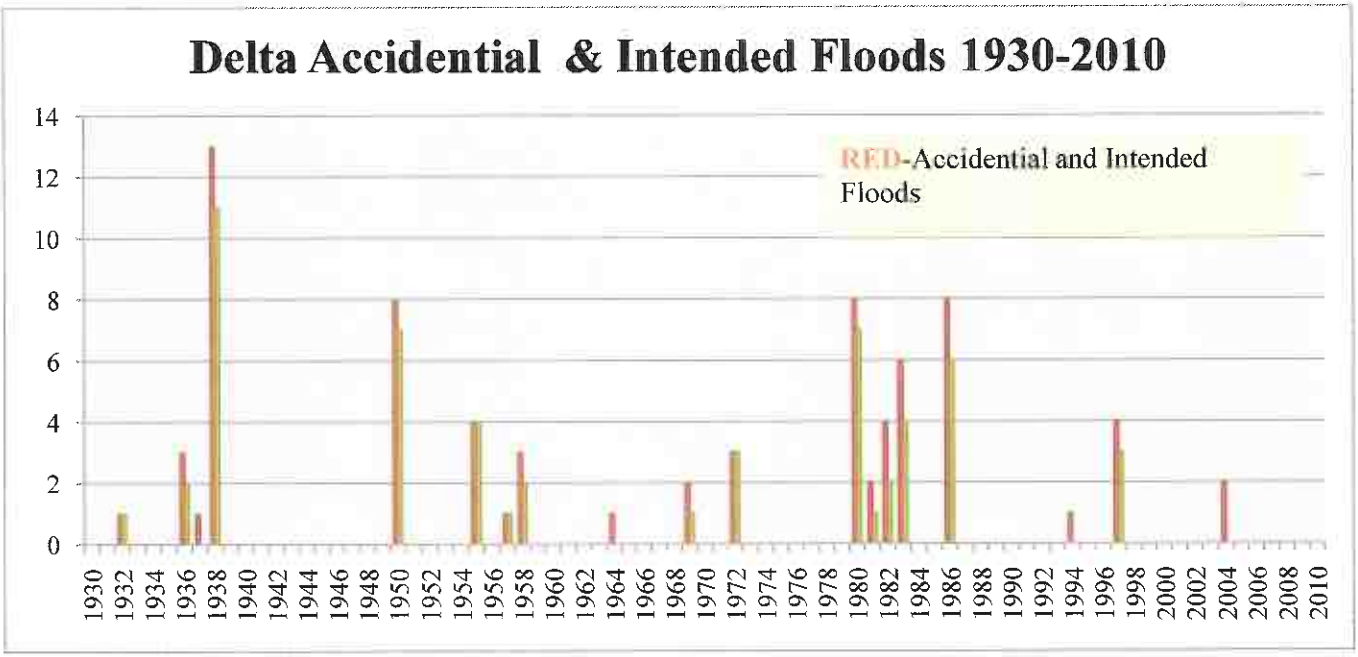


FIGURE 2
STIMATED FREQUENCY OF
:VEE OVERTOPPING UNDER
PRESENT CONDITIONS

The map above is page 10 from the 1975 proposal for levee improvements, which were done, to avoid the estimated "levee overtopping" if the work was not done. The importance of this map is that it recognizes the "controlled flooding" islands. Note also that Ryer Island, Grand Island, Pierson's District, Sutter Island and Prospect Island are not considered flood risks in 1975.

So why would DWR now list the same controlled flood events as if they were accidental floods? Below is a table showing Accidental floods, which defines between islands that were intentionally flooded at various times, islands that were flooded and remain flooded for water storage or ecosystem restoration projects, and flood events that were intended to be field studies for In-Delta Storage modeling reports. (Note that DWR in 2006 compiled a summary of the costs of "major Delta levee breaks[20]" and the last major north or central Delta levee break was in 1986, and in 1997 there was a levee break in the lower San Joaquin area. No mention of Jones Tract 2004 levee breach which was reported to be the most expensive one, most likely due to the extended studies associated with that breech.)

Compare the red bars which include both intended and accidental foods, with the green bars, which include only *accidental* floods of Delta Islands in use today:



Historical data shows the clear trend away from levee failures as the state and federal agencies have communicated more and managed the water systems jointly. 1997 was the last time there were accidental Delta floods, and the major flood of Tyler Island was the result of overflow from the "controlled flood" area of McCormack/Williamson Tract. Notice that the much publicized 2004 Jones Tract "sunny day" failure is listed as an intended flood, not an accidental one. That is because documents indicate USBR/DOI was aware of the Jones Tract levee failure on June 1, 2004 (see the DCC operations log for 6/1/2004) but it was not reported by DWR until June 3, 2004. Reports show from 2002 to June 1, 2004 there was substantial focus on computer modeling and research for the "In-Delta Storage Project"[21] (IDSP) using Bacon Island and Webb Tract for in-delta water storage. In other words, the data compiled from the breach of Lower Jones Tract levee was intended and used as a "field study" for the Bacon Island IDS proposals[22]. In the computer modeling, Jones Tract field study data was logged in under "Bacon Island" as noted in the later reports on the matter[23].

Compare the DRMS 2008 Delta Island Inundations map below with a more accurate representation on the following page and see if you guess how many ways the DRMS 2008 map represented incorrect data.

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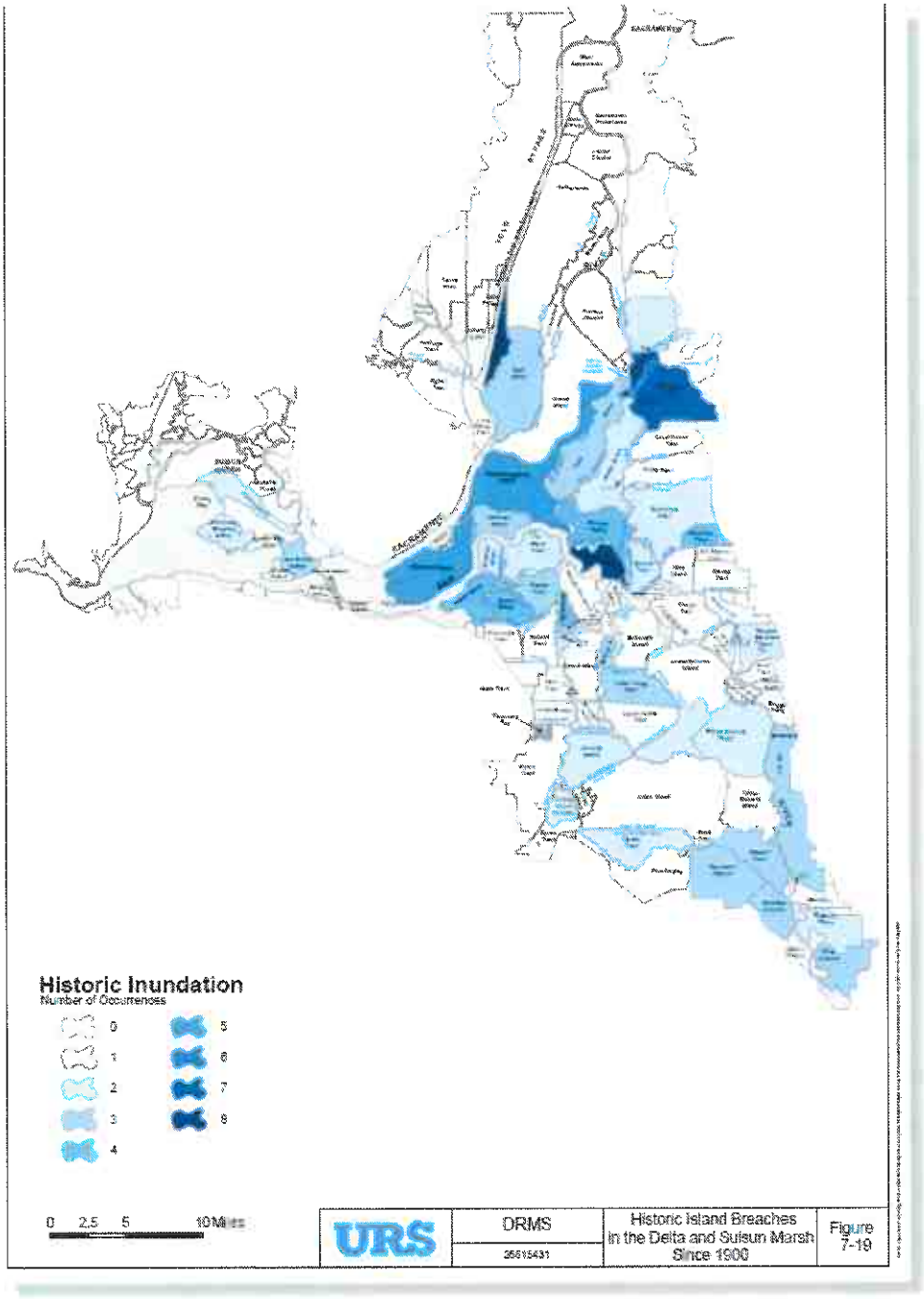
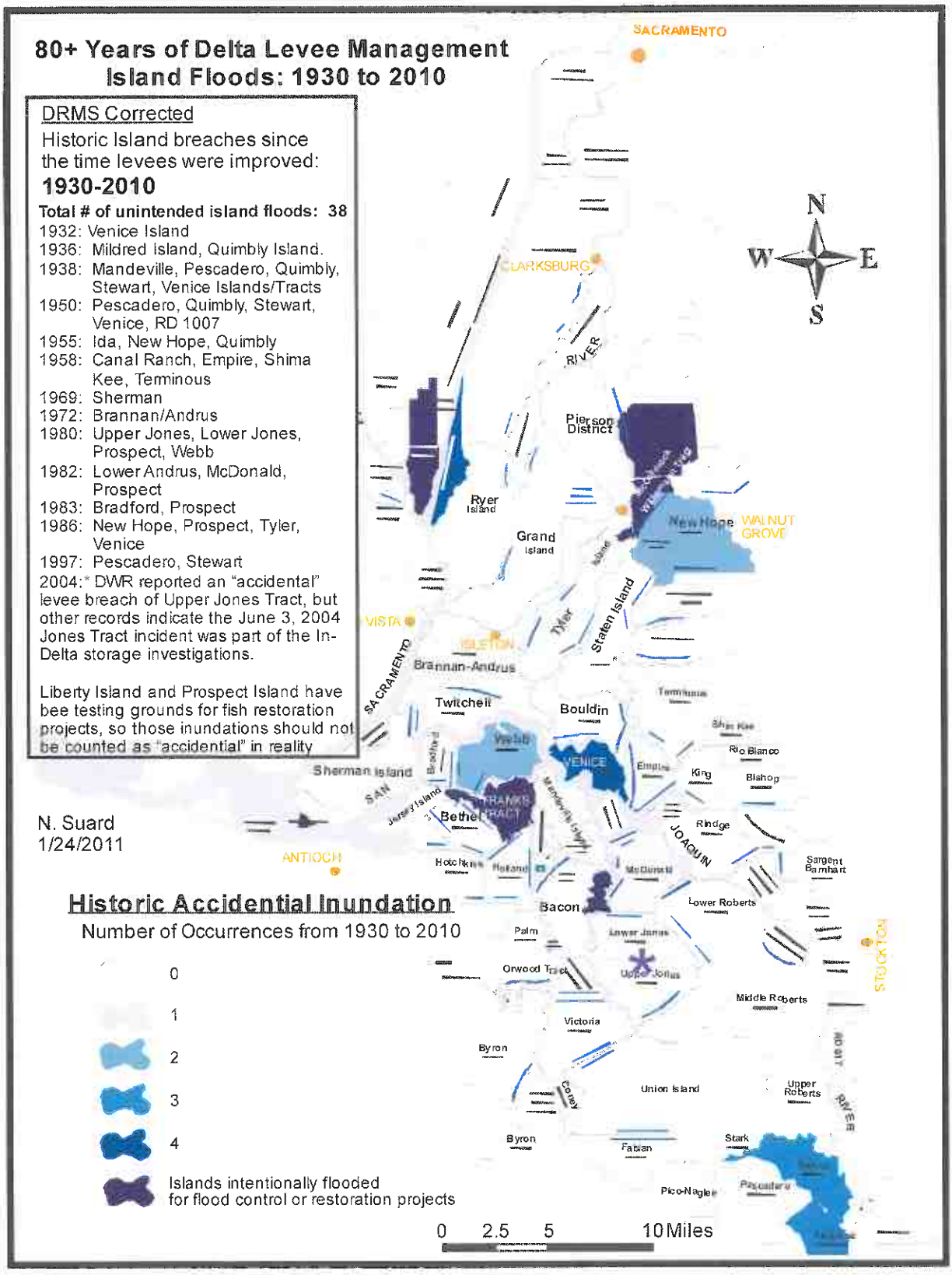
[20] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/Comparison_of_Major_Levee_Breaks_in_Delta.pdf
[21] http://deltarevision.com/2011/Bacon_Island_Jones_Tract_field_studies.pdf
[22] http://deltarevision.com/Jones_Tract.htm
http://deltarevision.com/Delta_maps/In_Delta_water_storage.htm [23]

Pay attention to Ryer Island, Prospect Island, Grand island, Tyler Island, McCormack/Williamson Tract, Dead Horse Island, Lower Jones Tract, just to name a few of the islands with misstated history in DRMS.



Note, also, that in December 2009, DRMS Fiinal Phase 1 was revised regarding Ryer Island flood history, at the instance of Ryer landowners[24]but many of the tables reflecting means and averages of flood history were not corrected, so the DRMS report continues to reflect false data regarding Ryer Island along with other Delta islands.[25] The incorrect data has continued to be used or referenced in reports by PPIC, some US Professors, and most recently DRMS Phase 2 Report.

[24] http://ryerisland.com/DRMS_wrong_on_ryer_island.htm emails & documents with DWR regarding Ryer Island flood history
[25] http://ryerisland.com/images/smalls/drms-using_maps_to_hide_mistakes.jpg


80+ Years of Delta Levee Management
Island Floods: 1930 to 2010
DRMS Corrected
Historic Island breaches since the time levees were improved:
1930-2010
Total # of unintended island floods: 38
1932: Venice Island
1936: Mildred Island, Quimbly Island.
1938: Mandeville, Pescadero, Quimbly, Stewart, Venice Islands/Tracts
1950: Pescadero, Quimbly, Stewart, Venice, RD 1007
1955: Ida, New Hope, Quimbly
1958: Canal Ranch, Empire, Shima Kee, Terminous
1969: Sherman
1972: Brannan/Andrus
1980: Upper Jones, Lower Jones, Prospect, Webb
1982: Lower Andrus, McDonald, Prospect
1983: Bradford, Prospect
1986: New Hope, Prospect, Tyler, Venice
1997: Pescadero, Stewart
2004:* DWR reported an "accidental" levee breach of Upper Jones Tract, but other records indicate the June 3, 2004 Jones Tract incident was part of the In-Delta storage investigations.
Liberty Island and Prospect Island have bee testing grounds for fish restoration projects, so those inundations should not be counted as "accidential" in reality
N. Suard
1/24/2011
Historic Accidential Inundation
Number of Occurrences from 1930 to 2010
0
1
2
3
4
Islands intentionally flooded for flood control or restoration projects
0 2.5 5 10 Miles
N
W
E
S
SACRAMENTO
CLARKSBURG
RIVER
Pierson District
Ryer Island
Grand Island
New Hope
WALNUT GROVE
VISTA
Tyler
Staten Island
SACRAMENTO
Brannan-Andrus
Twitchell
Bouldin
Terminous
Shima Kee
Rio Blanco
Sherman Island
VENICE
Empire
King
Bishop
Jersey Island
Bethel
Ridge
JOAQUIN
ANTIOCH
Hotchkiss
Roland
McDonald
Sargent Barnhart
Bacon
Lower Roberts
Palm
Lower Jones
Upper Jones
Orwood Tract
Middle Roberts
STOCKTON
Victoria
Byron
Union Island
Upper Roberts
Byron
Fabian
Stark
Pico-Naglee
Pescadero

Map above was compiled from an extensive comparison of the various historical records and publications of Delta Flood history[26], summarized in the chart below, but still and estimate:

Island Name	80 year period:		Total # of	Total # of	106 years
	Island Floods 1930-1980	Island Floods 1981-2010	Floods-USACE	Floods-DWR previous docs	Floods-**DWR/DRMS** 1900-2006
Total Floods for the Time Period, 58 islands	22	9	35	34	158*
Andrus (upper)	0	0	0	0	1
Andrus (Lower)	0	1982	1	1	**5**
Bacon Island	0	0	0	0	1
Bethel Tract	0	0	0	0	**4**
Bishop Tract	0	0	0	0	1
Boudin Island	0	0	0	0	**4**
Brack Track	0	0	0	0	1
Bradford Island	0	1983	1	1	2
Brannan Island	1972	0	1	1	**5**
Byron Track	0	0	0	0	1
Canal Ranch Tr.	1958	0	1	1	0
Coney Island	0	0	0	0	1
Decker Island	0	0	0	0	0
Drexler	0	0	0	0	0
Empire Tract	1958	0	1	1	2
Fabian Tract	0	0	0	0	2
Grand Island	0	0	0	0	1
Hastings Tract	0	0	0	0	0
Holland Tract	0	1980	1	1	1
Hotchkiss Tract	0	0	0	0	0
Ida Island	1955	0	1	1	2
Jersey Island	0	0	0	0	**4**
Jones Tract (lower)	1980	2004*	2	2	**4**
Jones Tract (upper)	1980	2004*	2	2	1
King Island	0	0	0	0	0
Mandeville Island	1938	0	0	0	1
McDonald Tract	0	1982	1	1	1
Merritt Island	0	0	0	0	0
Medford Island					1
Mildred Island	1936	0	1	1	**3**
New Hope Tract	1955	1986	2	2	**7**
Orwood Tract	0	0	0	0	
Palm Tract	0	0	0	0	1
Paradise Junction					3
Pescadero Tract	1938,1950	1997	2	1	3
Pierson District	0	0	0	0	
Prospect Island	1980	82,83,86	4	4	**8**
Quimbly Island	1936,38,50,55*				**4**
Ringe Tract	0	0	0	0	0
Rio Blanco Tract	0	0	0	0	0
Roberts Island (lower)	0	0	0	0	1

[26] http://ryerisland.com/images/floods/delta_floods_final.pdf
http://deltarevision.com/maps/islands_floods_levees/usace_delta_flood_history_2007_report_to_congress.pdf

Roberts Island (middle)	0	0	0	0	2
Roberts Island (upper)	0	0	0	0	1
Rough & Ready	0	0	0	0	0
Ryer Island	0	0	0	0	**3**
Sargent-Barnhart	0	0	0	0	2
Sherman Island	1969	0	1	1	**5**
Shima Kee Tr.	1958	0	1	1	**4**
Staten Island	0	0	0	0	**2**
Shima Tract	0	0	0	0	1
Stewart Tract	1938,1950	1997	3	3	3
Terminous	1958	0	1	1	2
Twitchell Island	0	0	0	0	3
Tyler Island	0	1986	1	1	3
Union Island	0	0	0	0	1
Veal Tract	0	0	0	0	0
Venice Island	1932,38,50	1986	4	4	**8**
Victoria Island	0	0	0	0	2
Webb Tract	1950,1980	0	2	2	2
Woodward Island	0	0	0	0	0
Wright-Elmwood	0	0	0	0	0
RD 1007	1950	0	1	1	1
Summary: 58 islands	**22**	**9**	**35**	**34**	**158***
			USACE	DWR pre-2006	DRMS/DWR 2009

The following Islands and time periods were excluded from this study for the reasons given:	
Island history 1900-1929	Levees of the Delta had not been improved to withstand flooding prior to 1930, when work began by USACE as part of the initial state water canal project. It is scientifically inaccurate to assess risk of a structure using occurrences from prior to the time the structure was built. Note that prior to 2006, even DWR documentation focused on Delta flood history starting after 1930.
Franks Tract	Island was left flooded to be used for fishing, recreation and restoration field studies
McCormack/ Williamson Tr.	According to DWR 1975 documentation, these areas are state-owned and intentionally used for "controlled flooding", which accounts for the many times this area has been flooded. (DWR Bulletin No. 192, May 1975, page 10)
Dead Horse Island	Also listed as a "controlled flooding" island per above DWR report
Grainville Tract	Also listed as a "controlled flooding" island per above DWR Report
Clifton Court Forebay	Intentionally flooded to be used as surface storage area for the water export pumps
Suisun Marsh	DWR/DRMS included islands not previously listed in Delta studies, which makes it confusing and inflates flood incidents since the islands of Suisun Marsh area were never improved to withstand occasional floods.
Jones Tract	The 2004 flooding of Jones Tract (Upper and Lower) appear to have been a pre-planned field study extension of the In-Delta Storage investigations under CalFed and USBR jurisdiction. (See attachment 7 for details)

If DRMS Delta Flood history is substantially incorrect, then the DRMS seismic risk calculations, which included purported consideration of island flood history, would also be incorrect, logically. In addition, the pre-flooded island studies proposing which islands to "save" in case of levee breech are also based on false historical island flooding[27]. In other words, if you input wrong numbers into a formula, the outcome will also be wrong.

[27] http://deltasolutions.ucdavis.edu/pdf/WorkingPapers/LeveeDecisions-2009Draft.pdf

The next step, then, is to review the history of seismic events that caused levee failures in the Delta region, to better understand *current* seismic risk of Delta levees.

DRMS SEISMIC STUDIES: Regarding the risk to Delta levees from seismic event in the Bay Area, the formula used to come up with means and averages ignores factual history of individual Delta islands, then compiles data from islands within the legal Delta region with islands outside the Delta, to come up with means and averages that really do not apply to Delta islands. Data regarding past, present and projected island elevations were also used, and conflicts of elevation data for certain west and south Delta islands have been found. Clearly any lands located within California are subject to some damage from seismic events, but the areas of high risk are the San Francisco Bay area and the Los Angeles to San Diego areas, not the Delta. (Government agencies truly concerned with population safety might want to consider banning any future high rise commercial or residential developments in all top-level seismic risk areas…like the Oakland waterfront and all of San Jose).

NOTE: NO SEISMIC TIMELINE PROVIDED BECAUSE NO DELTA LEVEE HAS EVER BEEN KNOWN TO FAIL DUE TO SEISMIC ACTION IN NORTHERN CALIFORNIA. CONFLICTS OF ELEVATION REPORTING WILL BE ADDRESSED AT A LATER DATE.

The end result of the salad-bar approach to the DRMS report is that many other scientists, agencies and nonprofit organizations have been repeating the same false Delta island history data over and over again. If a lie is repeated over and over again, does that make it the truth? **No.** Each time the incorrect data is repeated, it puts the veracity and integrity of the reporting scientist at risk, exposes the scientist or reporting agency to legal exposure for disseminating false information, and exposes the taxpayer citizenship of the state to added expense when legal action is taken against the state for changes to the Delta based on false "science". Please take the time to review the following examples of reports, maps or documents which regurgitate the false data contained in DRMS Phase 1 Final Report from the following resources: PPIC[28], UCB[29], Laird Report to CA Assembly 2006[30], Delta Vision 2008[31], DFG/Delta Vision 2011[32]State of the Bay Report 2008[33] to name just a few.

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[28]

[29] http://deltarevision.com/maps/islands_floods_levees/urs-levee-floods-wrong.jpg

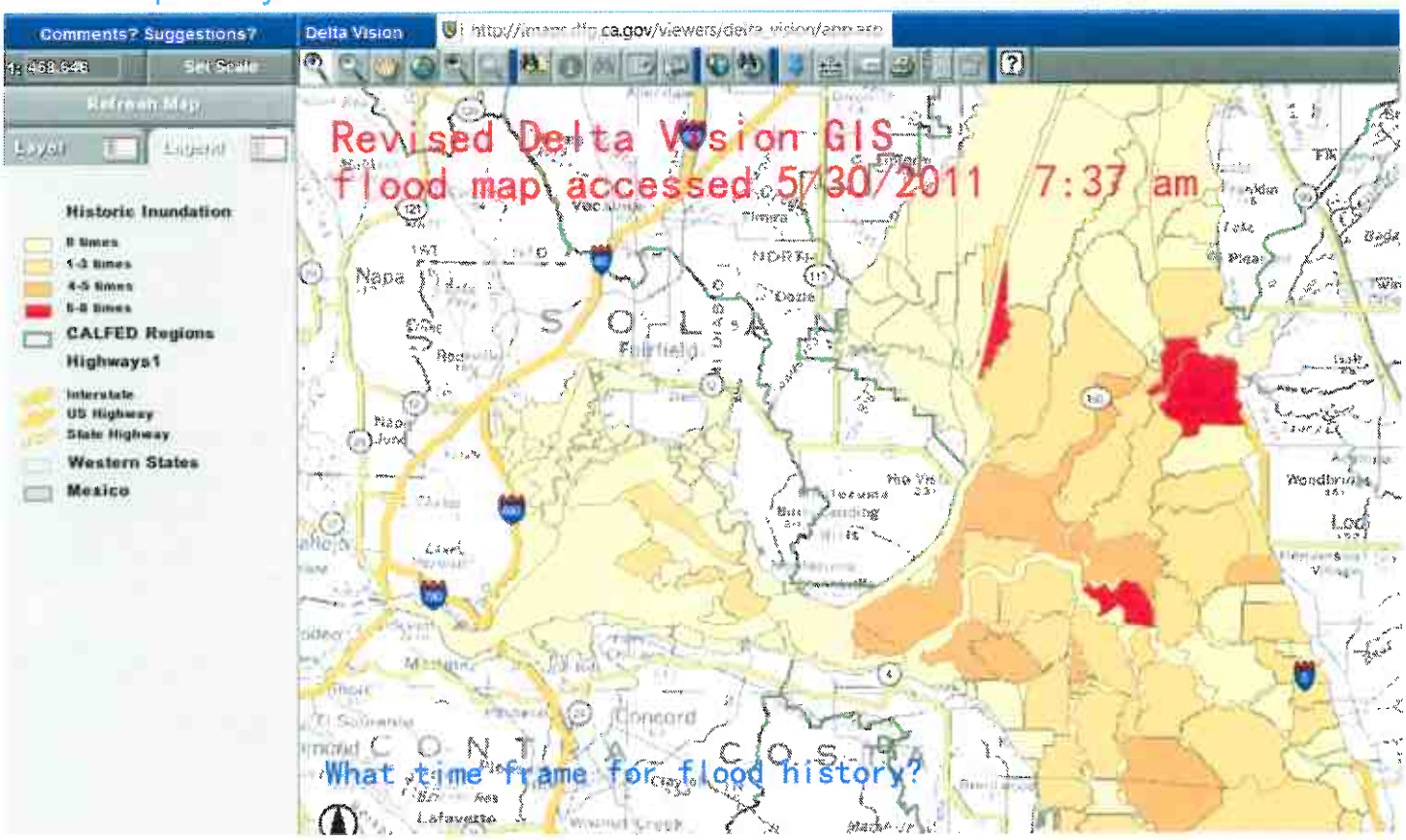
[30] http://deltarevision.com/maps/islands_floods_levees/2007_urs.jpg
http://deltarevision.com/maps/islands_floods_levees/2008ab1200_laird.GIF

[31] http://ryerisland.com/images/maps/DV_wrong_on_ryer.JPG 2008 Delta Vision GIS wrong on Ryer Island and
http://ryerisland.com/images/gov-pdfs/floods/2_Ryers-flooding.pdf

[32] http://imaps.dfg.ca.gov/viewers/delta_vision/app.asp Historical inundation map found through Delta Vision website-still wrong

[33]

Example: 2011 interactive online map at DFG website continues to display incorrect data compiled by DRMS:



The members of the DSC should not be put in the position of being asked to approved Delta actions based on salad-bar science…the false, inaccurate and inflated data found in the BDCP, DRMS Reports(s) and other documents under review by the DSC in support of revising the Delta into an ecosystem it that is purported to echo it past, but does not.

(go to next page)

But **it depends on who's counting**: When computing water flow and velocity for reports comparing past and current water flow in the Delta, I found formula conflicts between conversion tables used by DWR and USGS, dating back to 2000 and 2001. If the conversion table from DWR was used for the initial raw data and formula input for CALSIM modeling, wouldn't this explain one reason why CALSIM II modeling doesn't match actual water flow calculations for some studies? If an individual wanted to independently calculate actual Sacramento River historical inflow, exports and outflow to compare with proposed outflow after all the Sacramento River diversion-construction projects are up and running, (Freeport pumps, Yolo Bypass diversion, DCC reoperation, Stockton siphon-diversion, etc) it would require conversions between CFS, MGD, KAF, TAF and other measures of water volume and velocity.

Question for DWR and USGS that DSC should also answer before approving any Delta Plan: Which conversion table is correct: DWR or USGS? How much fresh water, (volume) at a minimum, will continue to flow on the Sacramento River and its tributaries between the cities of Sacramento and Rio Vista, including Steamboat Slough, Sutter Slough, Miners Slough? What is the expected velocity of water flow on Steamboat Slough, at Snug Harbor peninsula, each month of the year?

Below is a specific USGS conversion chart and the following pages a more detailed conversion charts from DWR or USGS. The difference of 48 gallons (cfs to gpd) between the conversion charts seems minimal. However, when one considers 48 gallons per day times the number of cubic feet per second of flow over a year's time, it becomes more substantial:

http://ks.water.usgs.gov/waterwatch/flood/conv.html#factors

Conversion factors for the above calculations:

1 ft³/s =

1.9835	acre-feet per day
7.48	gallons per second
448.8	gallons per minute
26,928	gallons per hour
646,272	gallons per day
28.32	liters of water per second
1,699.2	liters of water per minute
101,952	liters of water per hour
2,446,848	liters of water per day
2.446848	million liters of water per day
.646272	million gallons per day (Mgal/d)
62.5	pounds of water per second
3,750	pounds of water per minute
225,000	pounds of water per hour
5,400,000	pounds of water per day

http://www.water.ca.gov/swp/operationscontrol/docs/annual/annual01.pdf

Conversion Factors

Quantity	Multiply	By	To obtain
Area	acre	43,560	square feet
Volume	cubic foot	7.481	gallons
	cubic foot	62.4	pounds of water
	gallon	0.13368	cubic feet
	acre-foot	325,900	gallons
	acre-foot	43,560	cubic feet
	million gallons	3.07	acre-feet
Flow	cubic foot second (cfs)	450	gallons minute (gpm)
	gallons minute	0.002228	cubic feet second (cfs)
	million gallons day	1.5472	cubic feet second (cfs)
	cubic foot second (cfs)	646.320	gallons a day
	cubic foot second (cfs)	1.98	acre-feet a day
	million gallons day (mgd)	1,120	acre-feet a year
Pressure	feet head of water	.433	pounds square inch (psi)
Power	kilowatts (kW)	1.3405	horsepower (hp)

Look 5 rows up from the bottom for the cfs to gallons per day on the above chart

Below is another water conversion chart from USGS, also showing the conflict with DWR calculations:

http://water.usgs.gov/nwsum/WSP2425/conversion.html

U.S. CUSTOMARY (INCH-POUND)		U.S. CUSTOMARY (INCH-POUND) OR INTERNATIONAL SYSTEM (METRIC)
LENGTH		
1 in (inch)	=	25.4 mm (millimeters)
1 ft (foot)	=	0.3048 m (meter)
1 mi (mile)	=	5,280. ft
	=	1,609.344 m
	=	1.609344 km (kilometers)
AREA		
1ft^2 (square foot)	=	0.09290304 m^2 (square meter)
1 acre	=	43,560. ft^2 (square feet)
	=	0.0015625 mi^2 (square mile)
	=	0.40469 ha (hectare)
	=	4,046.9 m^2
1mi^2	=	640. acres
	=	259.00 ha
	=	2.5900 km^2 (square kilometers)
VOLUME OR CAPACITY (liquid measure)		
1 gal (gallon, U.S.)	=	231. in^3 (cubic inches)
	=	0.13368 ft^3 (cubic foot)
	=	3.7854 L (liter)
	=	0.0037854 m^3 (cubic meter)
1 Mgal (million gallons)	=	3.0689 acre-ft (acre-feet)
1 ft^3	=	1,728. in^3
	=	7.4805 gal
	=	28.317 L
	=	0.028317 m^3
1 acre-ft*	=	43,560. ft^3
	=	0.32585 Mgal
	=	1,233.5 m^3
SPEED		
1 mi/hr (mile per hour)	=	1.4667 ft/s (feet per second)
	=	0.44704 m/s (meter per second)
VOLUME PER UNIT OF TIME		
1 ft^3/s (cubic foot per second)	=	448.83 gal/min
	=	0.64632 Mgal/d
	=	1.9835 acre-ft/d (acre-feet per day)
	=	28.317 L/s (liters per second)
TEMPERATURE [°F (degrees, Fahrenheit) to °C (degrees, Celsius)]		
(°F − 32) x 5/9 = °C		

* Volume of water 1 foot deep covering an area of 1 acre.

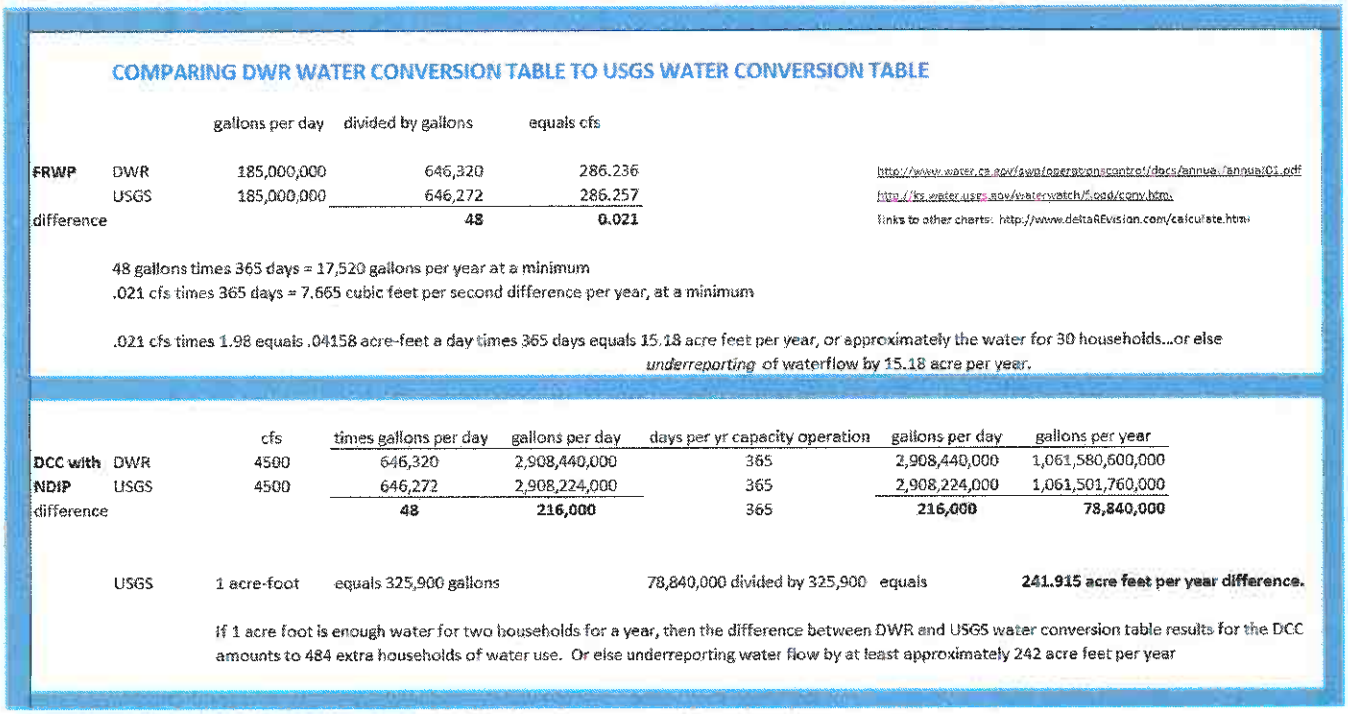
Please take a close look at the water conversion table used by DWR[34] and the ones used by USGS[35]. You will note that when converting between CFS and Mgd, the conversion numbers are slightly different, which results in different gross water flow answers. This is important because many of the planning documents related to water flow in the Delta use different methods to express flow and quantity of water, and CALSIM I and II, it is presumed, uses the DWR/USBR conversion formula. If the USGS formula is correct, wouldn't this be one

[34] http://www.water.ca.gov/swp/operationscontrol/docs/annual/annual01.pdf
[35] http://ks.water.usgs.gov/waterwatch/flood/conv.html

of the explanations for the difference in modeling flows vs. actual flows shown in some of the current conveyance and conservation planning documents?

For example, the Freeport pump project (FRWP) documents use the figure of 185 million gallons per day as the capacity of the facility, or rather the transport tunnels, but we do not know the capacity of the pumps in CFS or MGD, which could actually remove more Sacramento River water that would be discharged (via the pressure relief valve) into the Mokelumne River/conveyance channel. Should an interested person who wants to understand the total amount of water to be taken from the Sacramento River at Freeport use the conversion table from DWR/USBR or from USGS?

When the reoperation of the Delta Cross Channel Gates is included in the water flow calculations which define how much additional fresh water will be taken from the Sacramento River below Freeport, it makes a difference of almost 242 acre feet per year, or 79,840,000 gallons per year **plus** the unmonitored quantity of the FRWP pressure relief valve.



COMPARING DWR WATER CONVERSION TABLE TO USGS WATER CONVERSION TABLE

		gallons per day	divided by gallons	equals cfs	
FRWP	DWR	185,000,000	646,320	286.236	http://www.water.ca.gov/swp/operationscontrol/docs/annual/annual01.pdf
	USGS	185,000,000	646,272	286.257	http://ks.water.usgs.gov/waterwatch/flood/conv.htm;
difference			**48**	**0.021**	links to other charts: http://www.deltaREvision.com/calculate.html

48 gallons times 365 days = 17,520 gallons per year at a minimum
.021 cfs times 365 days = 7.665 cubic feet per second difference per year, at a minimum

.021 cfs times 1.98 equals .04158 acre-feet a day times 365 days equals 15.18 acre feet per year, or approximately the water for 30 households...or else *underreporting* of waterflow by 15.18 acre per year.

		cfs	times gallons per day	gallons per day	days per yr capacity operation	gallons per day	gallons per year
DCC with	DWR	4500	646,320	2,908,440,000	365	2,908,440,000	1,061,580,600,000
NDIP	USGS	4500	646,272	2,908,224,000	365	2,908,224,000	1,061,501,760,000
difference			**48**	**216,000**	365	**216,000**	**78,840,000**

USGS 1 acre-foot equals 325,900 gallons 78,840,000 divided by 325,900 equals **241.915 acre feet per year difference.**

If 1 acre foot is enough water for two households for a year, then the difference between DWR and USGS water conversion table results for the DCC amounts to 484 extra households of water use. Or else underreporting water flow by at least approximately 242 acre feet per year

It should also be noted that many of the eir/eis reports for the regional projects affecting the Delta utilized data from CALVIN modeling, which most likely calculated water flow based on DWR conversion charts. BDCP planning has most likely been based on DWR water flow calculations, without peer review as the "print screen" describes:

Summary of 958 pages of BDCP: ***increase water diversion 10% above D1641 standards; and base restoration plans on models that were not validated or peer-reviewed.***

Page 125 of 958 accessed at link below on 4/28/2011

bdcpweb.com/... 125 / 958

6. **Tidal Excursion:** The modeling supporting the assumption that tidal reintroduction to restore aquatic habitat in the Cache Slough area will substantially reduce tidal excursion up Sutter and Steamboat sloughs treats the "restored" areas as reservoirs that are filled with water. The analysis does not attempt to evaluate changes in tidal excursion as tidal marsh habitats are established over time.
7. **Modeling Notes:** Conclusions presented in this worksheet are sometimes based upon the modeling output presented by Armin Munevar from CH2MHill during our Team workshop on Jan. 21, 2009. These analyses rely heavily on the output of models, particularly CALSIM II and DSM2. The validation of these models for these analyses has not been peer-reviewed. Further, as in all models, the outputs depend heavily on the assumptions and parameters used as inputs. These include the operating rules, criteria, and limitations set by the proposed actions, as well as those included in the baseline. Changes in these rules as the actions are refined may alter the quantitative outcome of the Team's assessment. The models also use an 82-year historical record of flow as a boundary condition. Future patterns of flow, sea level, and temperature will be different from historical. This may cause the actual outcomes to diverge from the expected outcomes in terms of flow patterns, salinity, and exports. In particular, the shift to an earlier snowmelt peak forecasted by climate analyses has already been observed and rising sea level will increase the influence of tides in the project area. The Team suggests that future iterations of the analysis include sensitivity analysis with variations in operating criteria and precipitation patterns based on climate and sea level forecasts.
8. **Diversion Point Flexibility:** BDCP has proposed an assumption of 2-10% more water diversion than D1641 standards. A dual conveyance system would provide flexibility in switching between north and south Delta diversion points. However, this is not quantitatively demonstrated and this lack of quantitative information is problematic when analyzing potential outcomes in this worksheet. This Team recommends that BDCP

In summary, the question is, which water conversion formulas are correct, DWR/USBR or USGS? How much fresh water, (volume) at a minimum, will continue to flow ***on the Sacramento River*** and its tributaries between the cities of Sacramento and Rio Vista, including on Steamboat Slough, Sutter Slough, Miners Slough? What is the expected velocity of water flow on Steamboat Slough, at Snug Harbor peninsula, each month of the year? Note that in the BDCP and some USFWS documents, Steamboat Slough is labeled as the Sacramento River, so the questions apply to both Steamboat Slough and the Sacramento River, also called "Old River" on historic maps, around the Isleton area.

E. **What's Where When or 101 Wrong Maps of the Delta: The "Flooded Islands Pre-feasibility Studies and DRMS Reports Phase 1 and 2**. Several different important Delta-related studies and agencies confuse the islands and waterways of the Delta. DRMS Phase 2 suggestion for "pre-flooded islands" is based on 2005 modeling which appears to have substantially confused the names and/or locations of Delta islands, which now puts into question the veracity of any "pre-flooded island" studies based on the original 2005 modeling report. It is assumed the DSC will be asked to approve the "pre-flooding" of some Delta Islands. Before any approvals are made, the pre-flooding studies should be independently reviewed with close attention to the inaccurate historical data used, the confusion of the Delta island locations in the "base study" and the true economic impacts to Delta landowners, businesses and counties, which were also inaccurately reported in DRMS Phase 1 and 2.

Question for BDCP/DSC/DWR: If the scientists or government contractors for the BDCP can't even come up with accurate maps of the Delta, why should their study results be accurate or trusted?

Several different important Delta-related studies and agencies confuse the islands and waterways of the Delta. When an agency or scientist conducts a study of the Delta, he/she/they should first be sure of the physical location of the Delta Islands, and those island names. The confusion of Delta island names and locations affected not just the DRMS report (section A above) but also many other currently-used reports intended to validate the building of the central conveyance canal and other ongoing Delta construction projects. Just a few of the wrong Delta maps are provided below, but a compilation of many more are available online[36].

In order to recognize wrong maps of the Delta, one must have as reference a correct map of the Delta Islands and waterways. The first map below appears to show correct island and waterway names. On the following map red circles were added to help the viewer pay attention to the areas of the subsequent sample Delta maps that display wrong geographic information. (You might want to test your Delta knowledge by guessing how many times or ways each of the maps are wrong, when compared to the Delta & Suisun Marsh map:

Next page: Base map to use for comparisons: Delta island and waterways from USACE [37] that includes Suisun Marsh area (not part of the Delta); note the map is similar to the CALFED 2000 ROD documents[38]

[36] http://www.deltarevision.com/101wrongmapsofthedelta.html
[37] http://www.spk.usace.army.mil/organizations/cespk-pao/delta/delta_reports/Plate%202%20Regional%20Map.pdf
[38] http://calwater.ca.gov/calfed/objectives/Levee_System_Integrity.html and also see http://calwater.ca.gov/content/Documents/library/305-1.pdf page 132

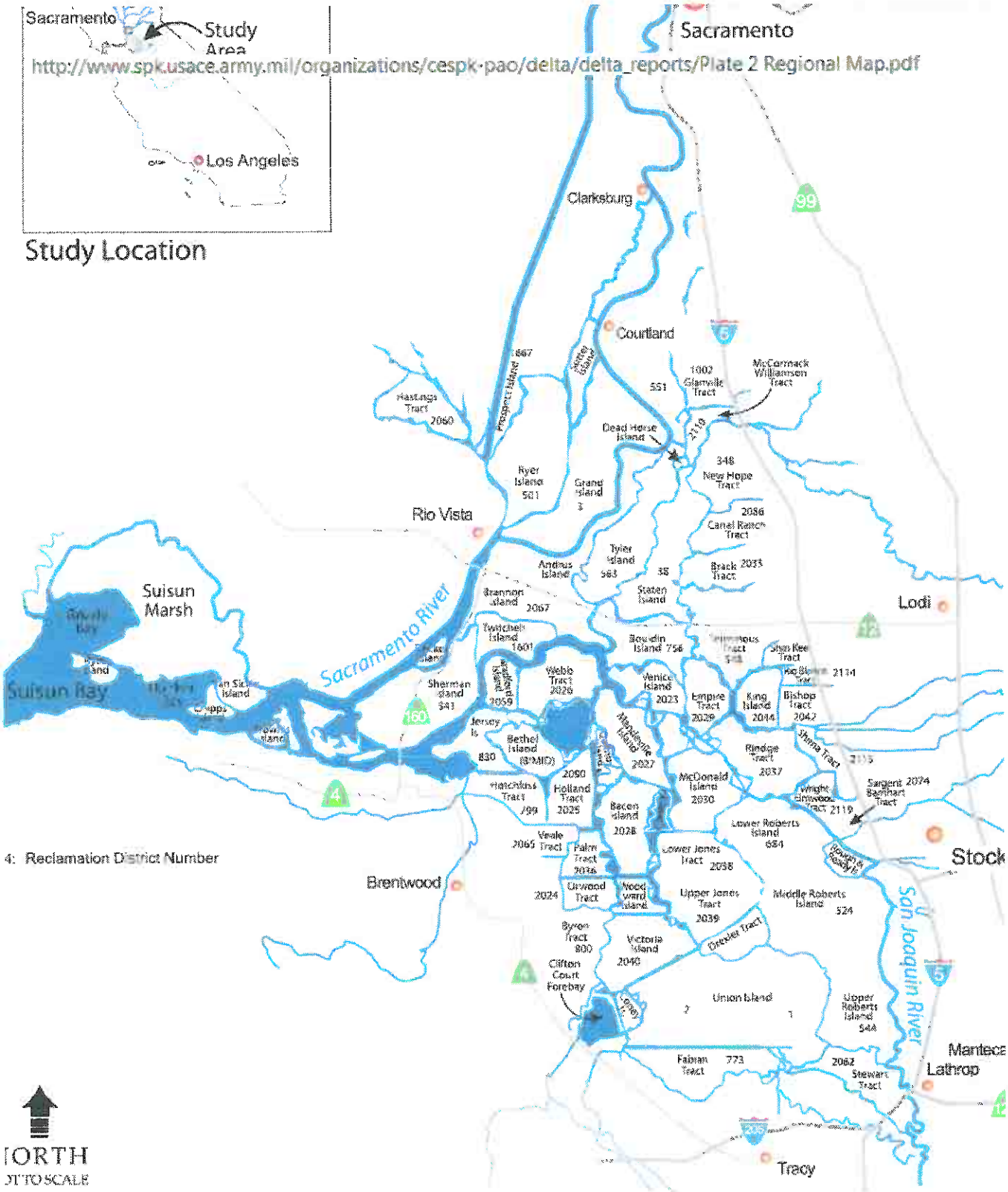
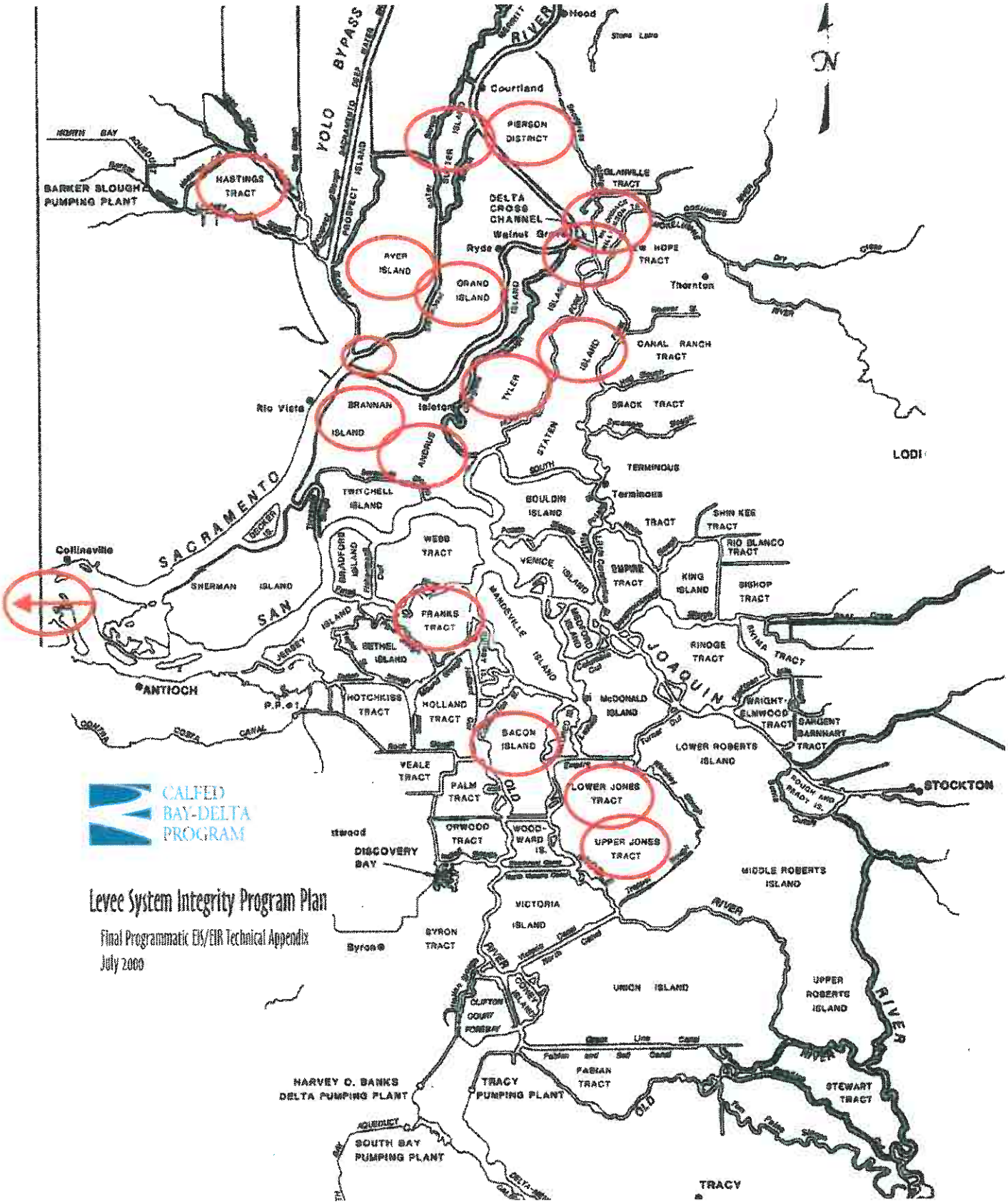


Plate 2. Regional Map of the Sacramento - San Joaquin Delta, California

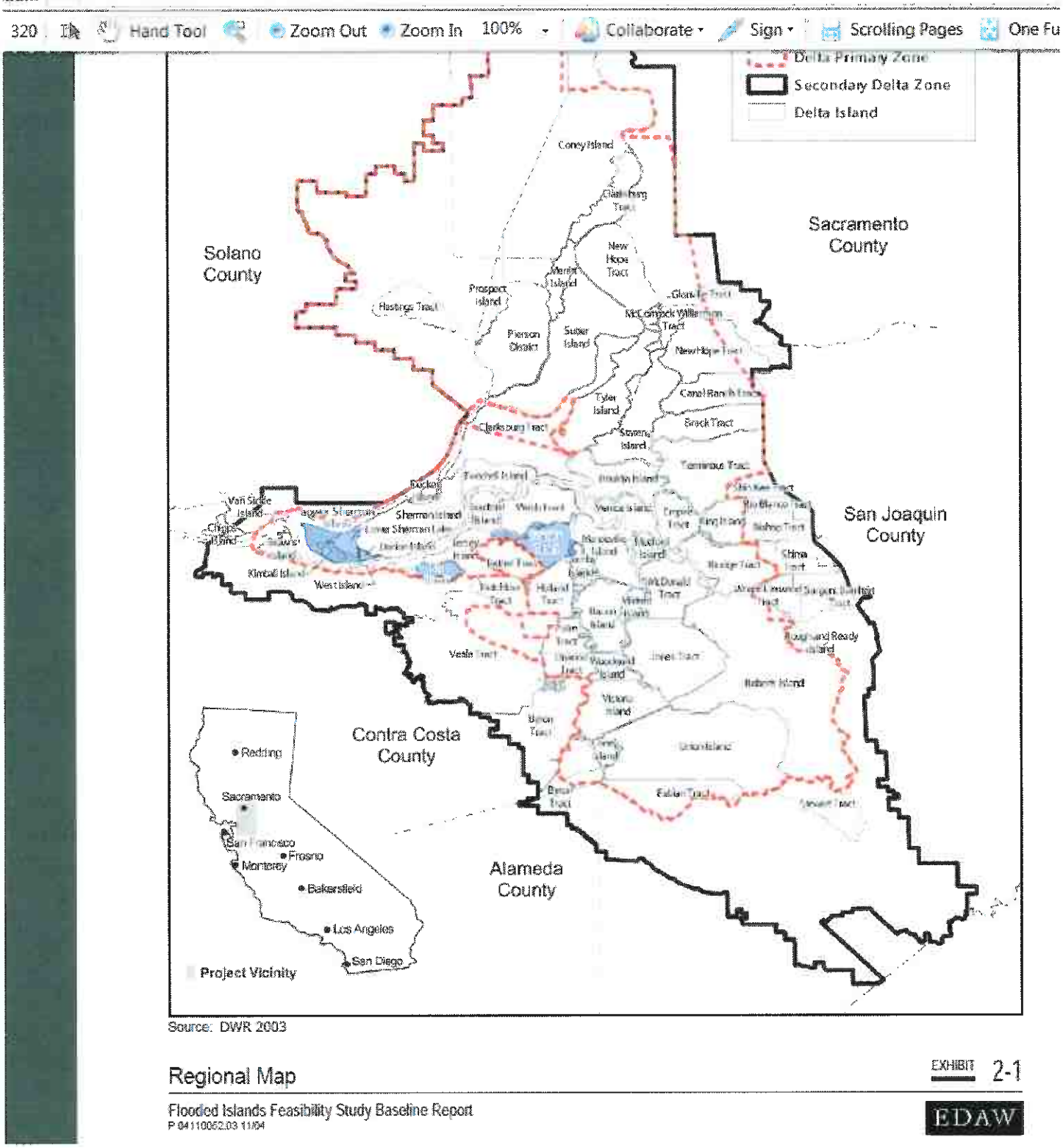
Above, Delta Islands AND Suisun Bay and Marsh Islands, using current correct island names. But missing some Suisun Bay/Marsh Islands included in DRMS reports.



Noting the red circles above, added to a CALFED map from 2000, will help the reader to identify the mistakes of the following maps and studies:

Compare the CALFED map above with the "Flooded Island Feasibility Baseline Report from 2005.[39]
Hint: there are at least 8 mistakes in this one map:

http://baydeltaoffice.water.ca.gov/ndelta/summaryreport/documents/FloodedIslandFeasibilityStudyBaselineReport.pdf



Source: DWR 2003

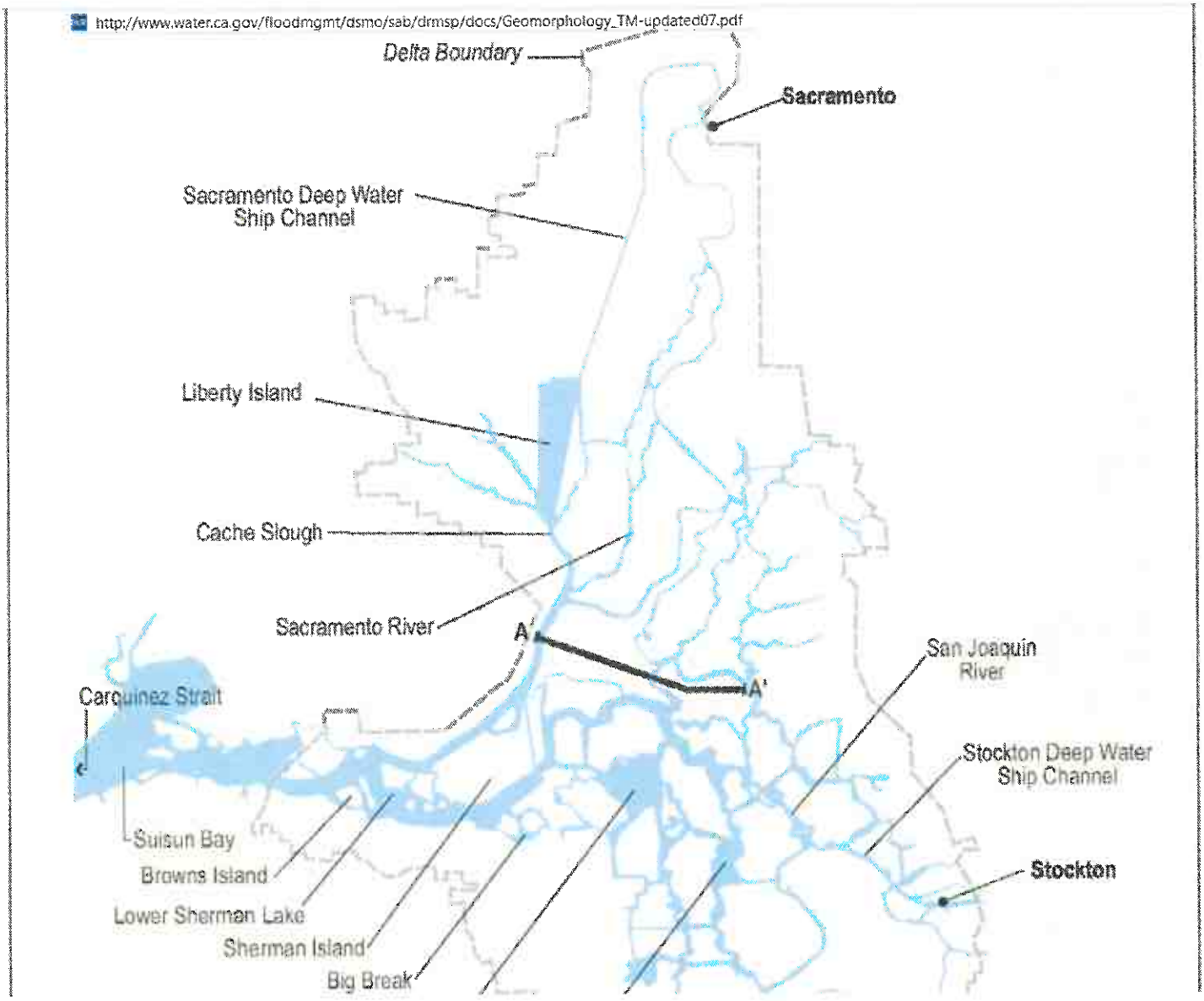
Regional Map

EXHIBIT 2-1

Flooded Islands Feasibility Study Baseline Report
P 04110052.03 11/04

EDAW

[39] http://www.water.ca.gov/frankstract/docs/%286%29Flooded%20Islands%20Pre-Feasibility%20Report.pdf page 19 and also http://baydeltaoffice.water.ca.gov/ndelta/summaryreport/index.cfm for links to the modeling results

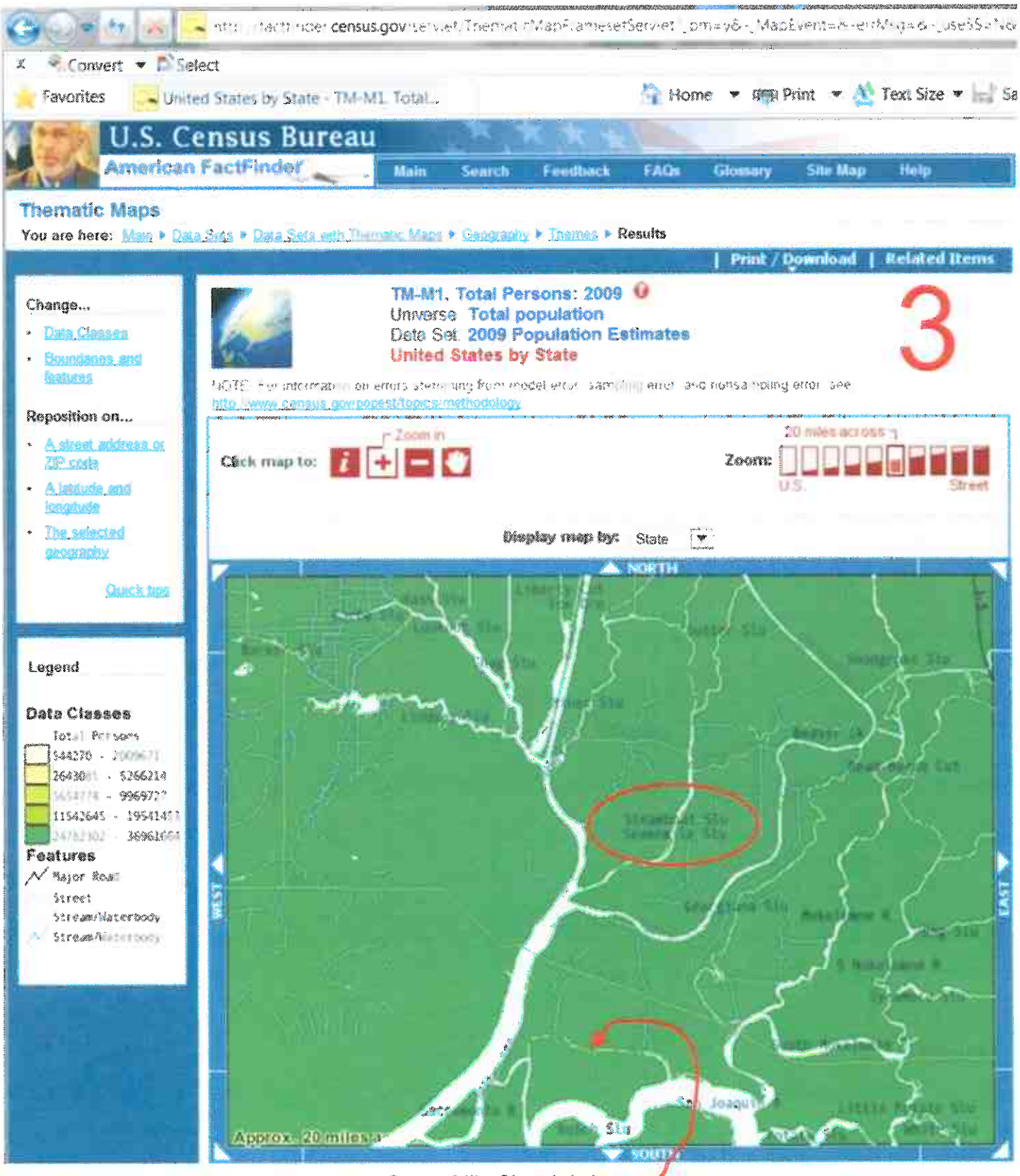


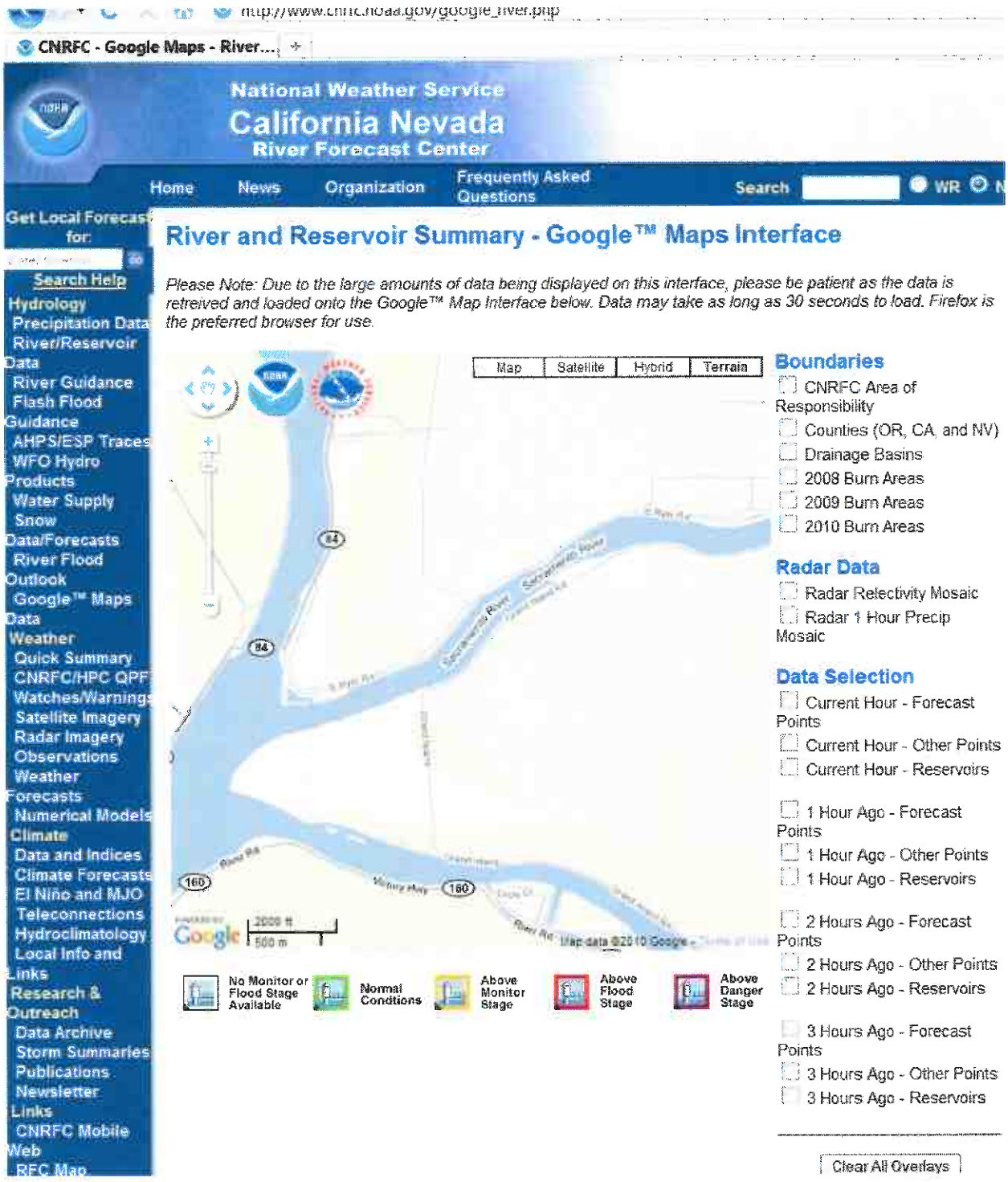
The above map is from the DWR study on geomorphology dated 2007[40]. It's a test of your knowledge of some of the Delta waterways. Hint: Look for the Sacramento River, Steamboat Slough, Sutter Slough. Note the study that shows online has now been corrected, at least the map has been corrected.

Go to next page for more example of incorrect Delta maps from the last few years, provided to prove a point, even though the maps may not be related to DSC Delta Plan decisions at this time:

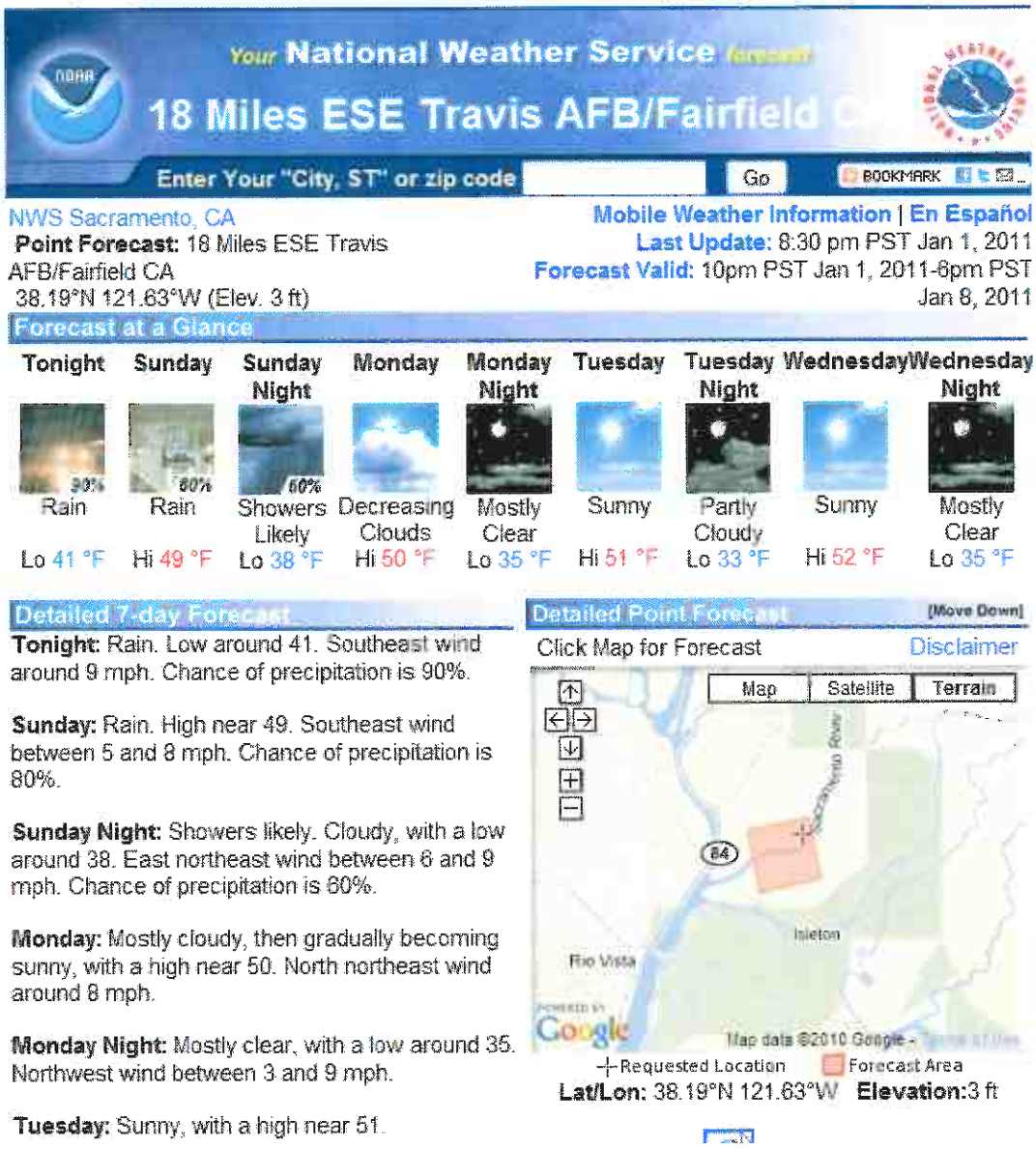
[40] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/Geomorphology_TM-updated07.pdf See page 33
http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/Geomorphology_TM.pdf the same map, corrected

Below is the US Census Bureau map, which renames Steamboat Slough as Seven Mile Slough. Seven Mile Slough is located in Sacramento County, down by Twitchel Island, not where the map below shows it. If the US Census Bureau can't even get a waterway location right, how can we trust their reports on the census for 2010?!

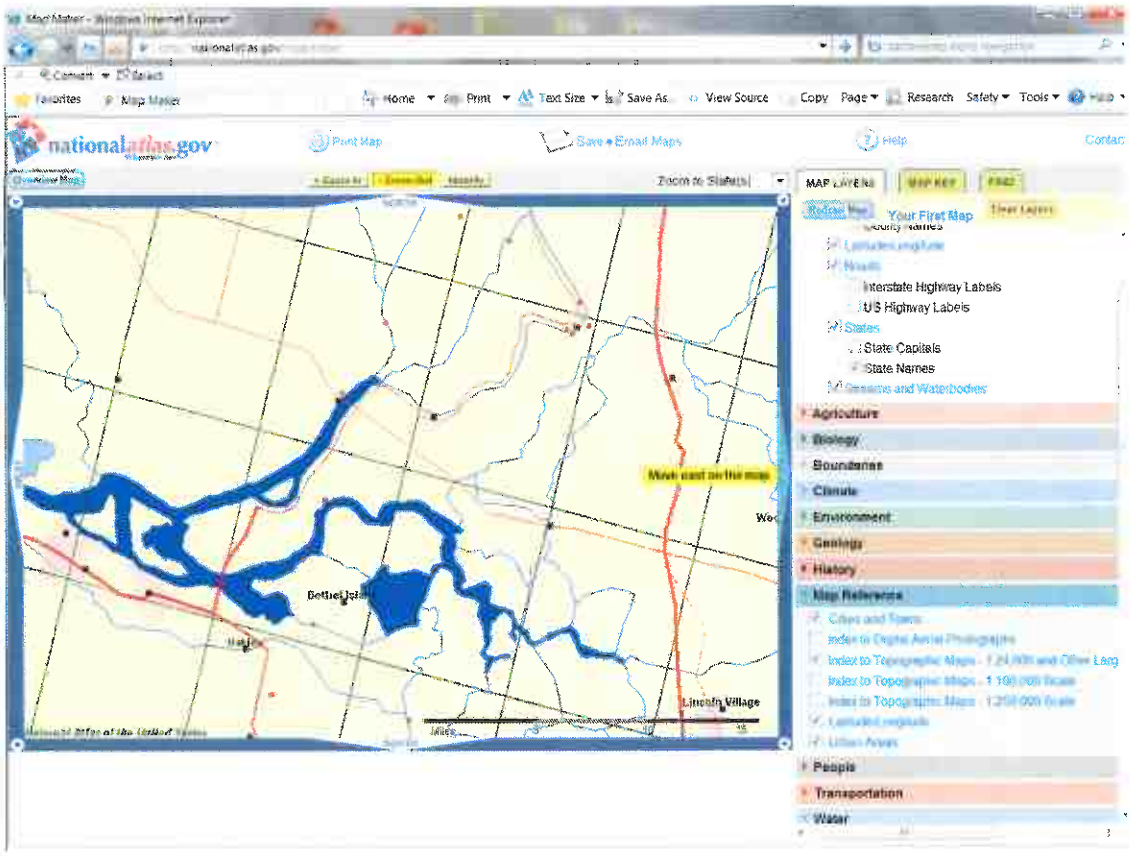




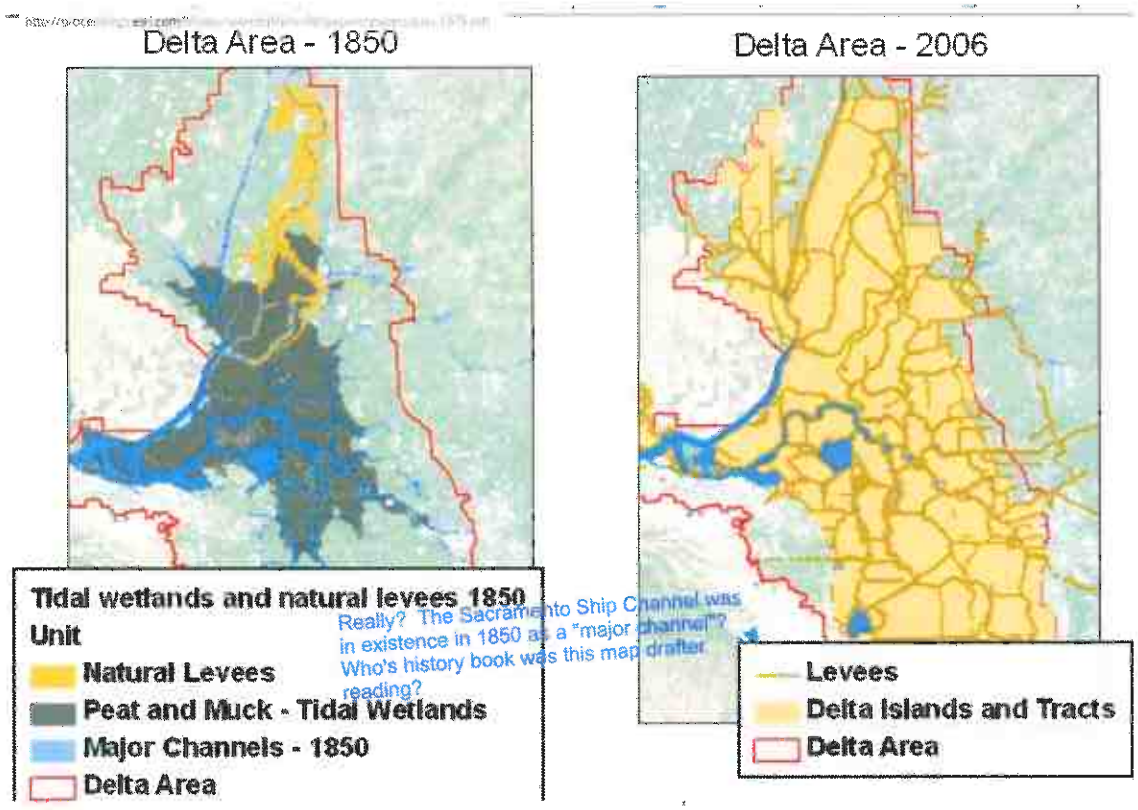
Above is a "print screen" from the NOAA website, and it also confuses Steamboat Slough with the Sacramento River. In cases of emergency, does NOAA recommend boaters on Steamboat Slough define their location as Sacramento River instead in 2011?



NOAA national weather service website "print screen" also shows Steamboat Slough as the Sacramento River. When did Steamboat Slough officially get renamed to Sacramento River?

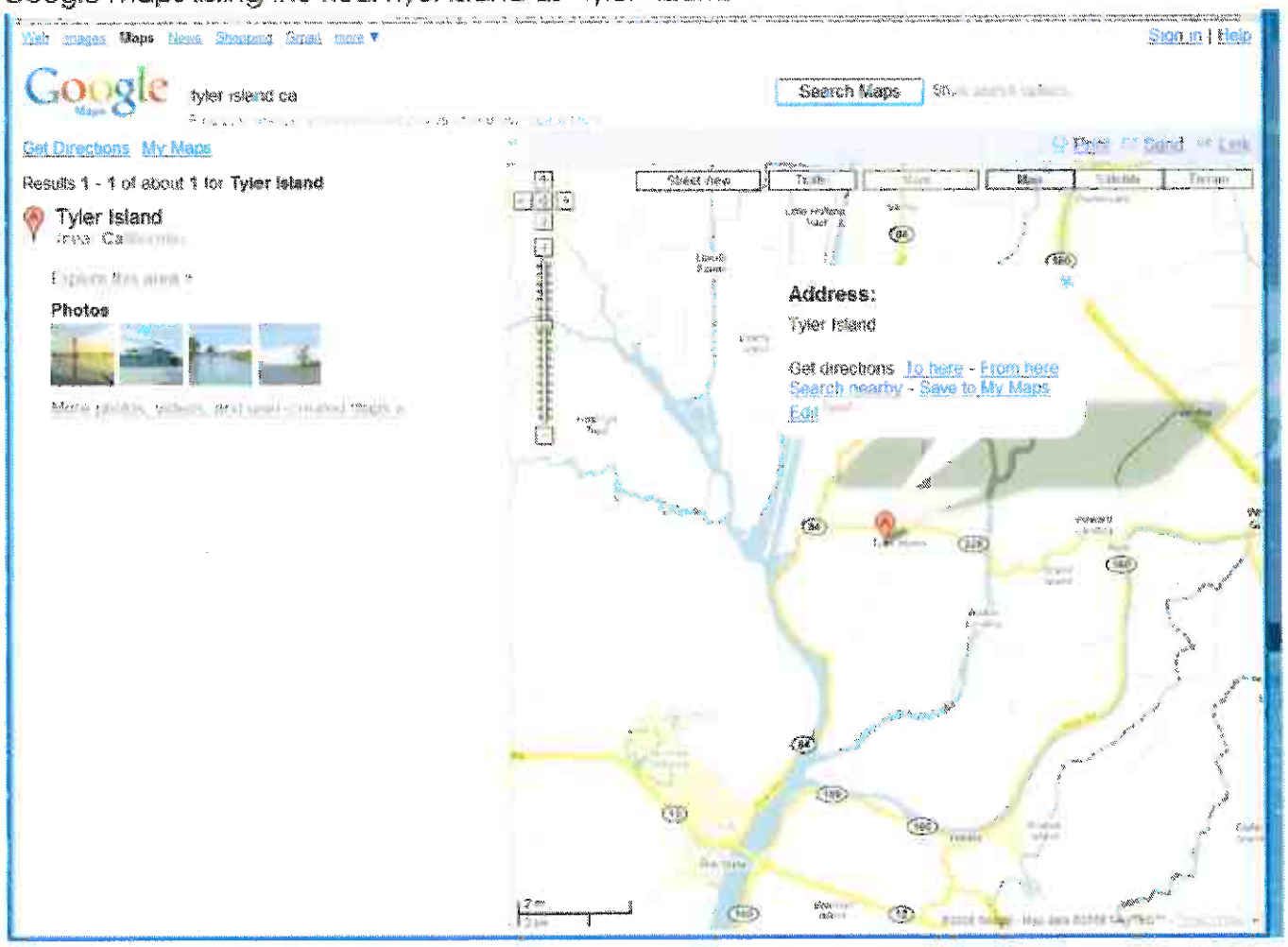


The current national atlas eliminates Sutter and Miner Sloughs. Why?



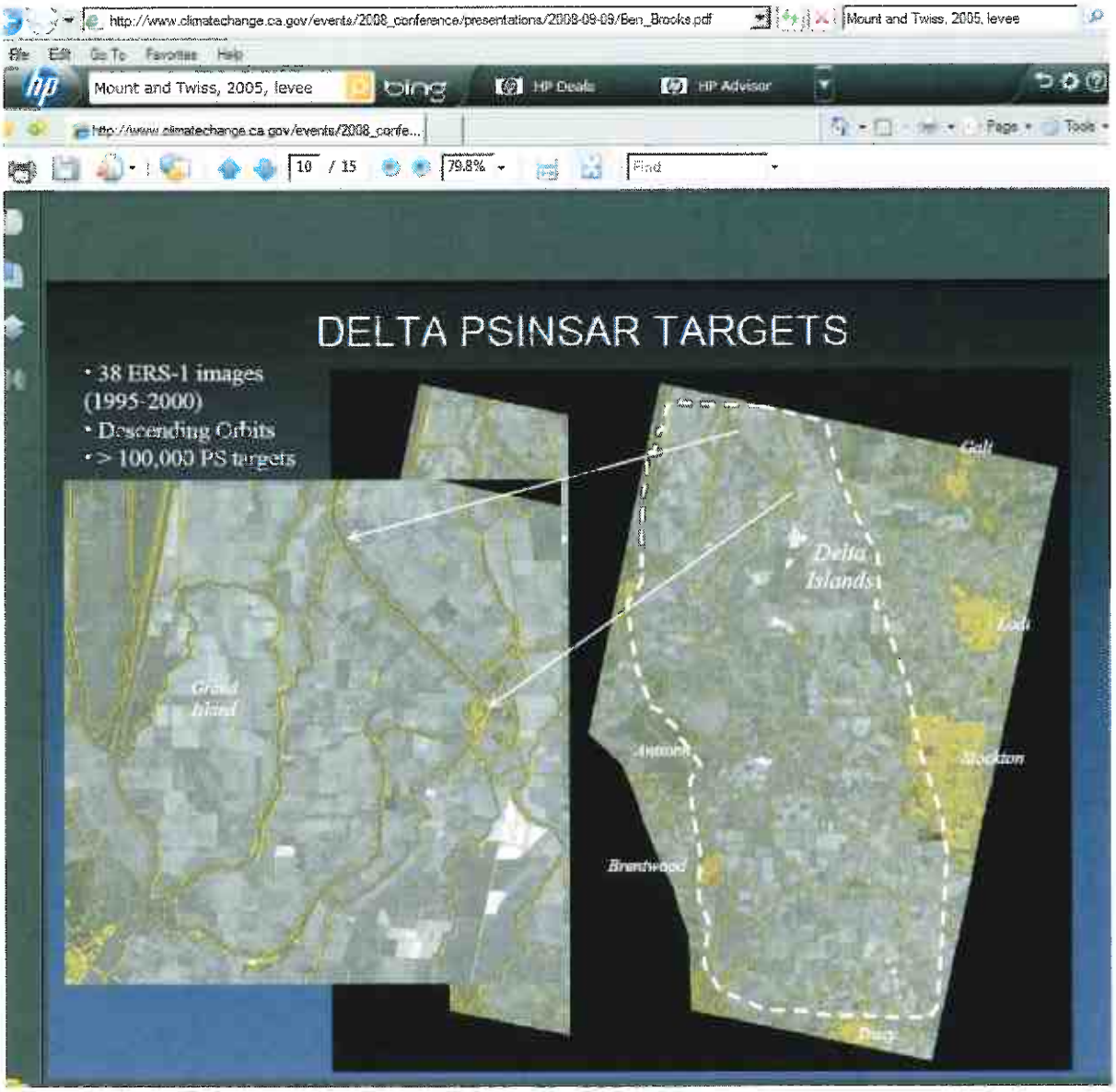
Another example of using confused Delta maps and history to create graphics to convey false data.

Google maps listing the Real Ryer Island as "Tyler" Island



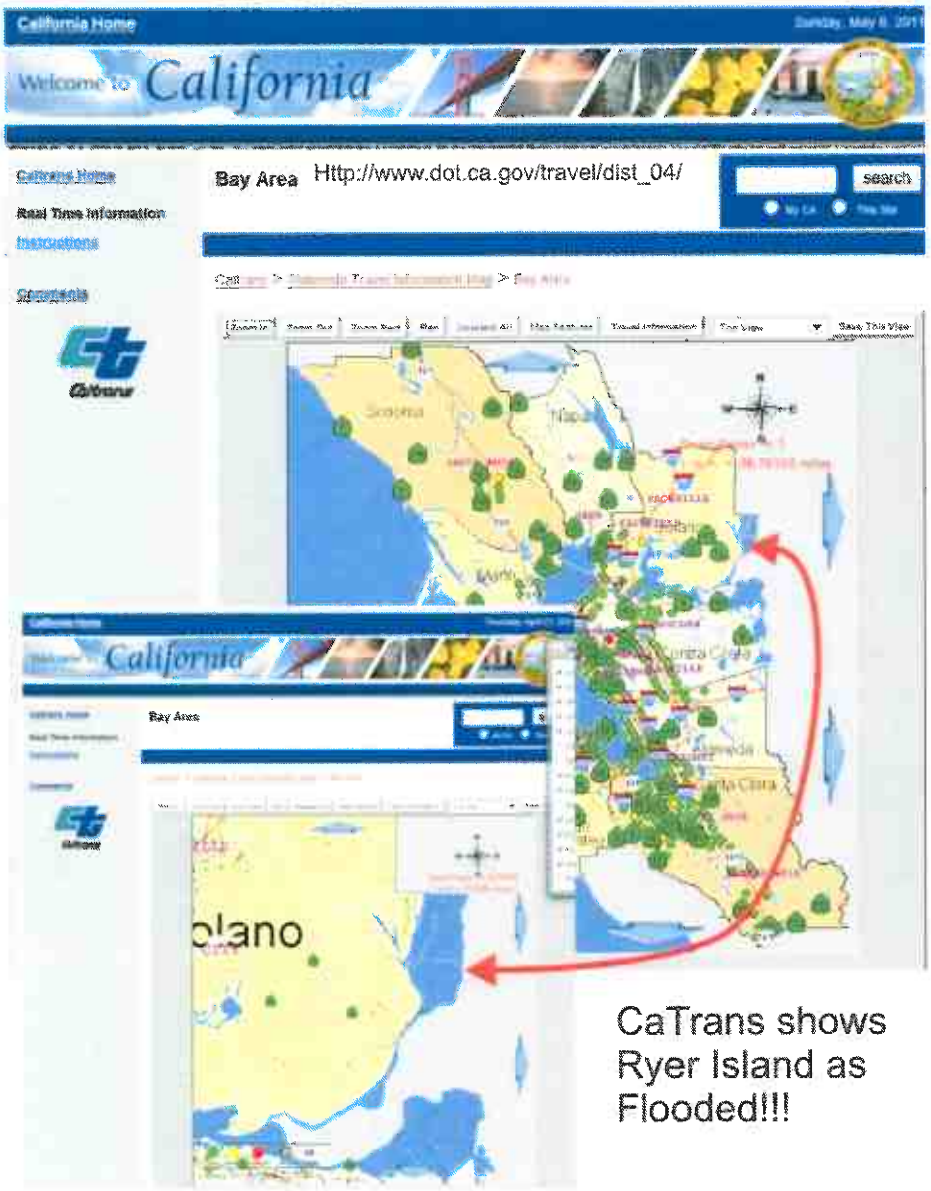
Part of the problem with wrong Delta island and waterway names is that Google has been incorrectly labeling islands and waterways since at least 2005. When notified with the assistance of county survey offices, Google simply eliminated Delta Island names from their general online map page. However, this did not correct the mistakes made in reports generated 2004 to 2009, and the problem of Delta island and waterway incorrect labeling continues. Google apparently currently has a contract with several governmental mapping agencies, which might explain why normally accurate organizations like NOAA is currently displaying incorrect Delta location names online.

(go to next page)



The above slide is just one example showing how Delta-related speakers, including professors from UCD, continue to use incorrect Delta names in their presentations: Ryer Island is labeled as "Grand Island" above.

CURRENT CALTRANS DISTRICT 4 "TRAVEL MAP"



Going back to the basic questions: If the scientists or government contractors for the BDCP and other proposed actions can't even come up with accurate maps of the Delta, why should their study results be treated as accurate or trusted? Is the DSC acting responsibly or irresponsibly when approving actions in the Delta based on reports and modeling data that have been shown to be inaccurate? DRMS Phase 2 report lists many targeted "pre-flood" islands based on the "Flooded Island Feasibility Baseline Report"[41] from 2005. Does DRMS Phase 2[42] really mean pre-flooding Pierson District, Sutter, Grand, Ryer and Merrit Islands as they are located in the 2005 report, or Twitchel, Sherman, Brannan-Andrus Islands etc. as they are located in the DRMS Phase 2 report?[43]

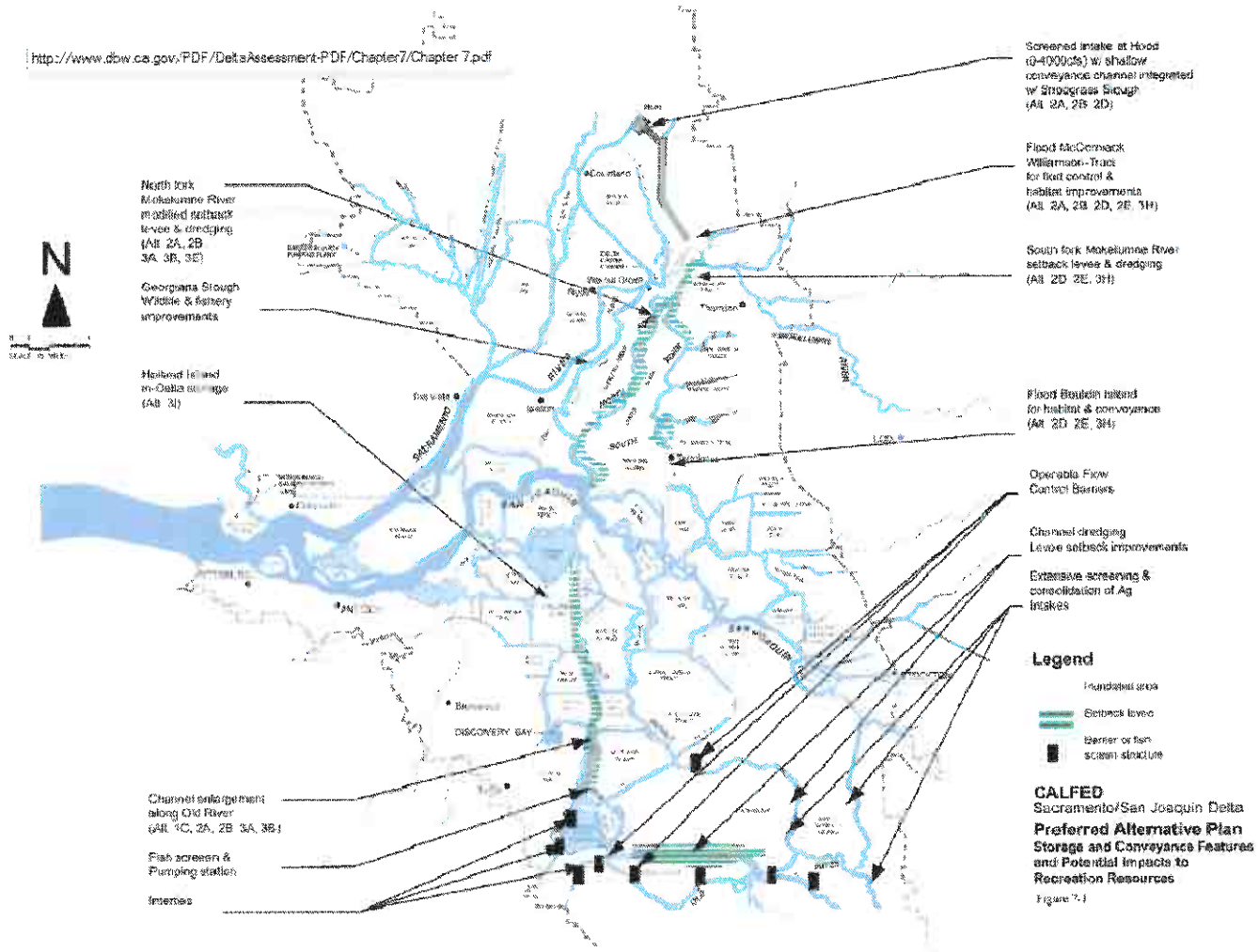
[41] http://www.water.ca.gov/frankstract/docs/%286%29Flooded%20Islands%20Pre-Feasibility%20Report.pdf page 19
[42] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/phase2_information.cfm
[43] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/DRMS_Phase2_Report_Section6.pdf

D CALFed construction projects related to the 2000 *conveyance* portion of the plan have continued to be built as "regional projects". It appears that as of June 2011 most of the conveyance elements of the CalFed 2000 ROD "preferred alternative" are complete or almost complete, without approval by the DSC.

Question for BDCP or DWR: Is it expected the central conveyance or "preferred alternative" which includes reoperation of the DCC, expanded capacity of Freeport pumps, revision to McCormack/Williamson Tract, dredging around the area of DCC and Dead Horse island to facilitate greater water flow down the Mokelumne Rivers, Stockton siphon, etc will be operational by the end of 2012 or earlier, and will the DSC be asked for approval for the remaining portions of construction even though those regional projects completed their eir/eis processes in past years? Will approval include use of Staten Island for In-Delta water "detention", McDonald or Bacon Island, or other Delta islands and if so, which islands are planned to be IDS? Since URS has conducted extensive studies regarding the Suisun Marsh area, including "Ryer Island" (the other Ryer Island), but the Suisun Marsh-Ryer is often eliminated from planning maps, does that mean the detail studies actually intended to be focused on the "Ryer Island" north of the Rio Vista bridge, bordered by Steamboat Slough? Perhaps this is one reason CALTRANS lists Ryer Island as a lake?

In any case, the DSC should not approve further elements of the central canal or "conveyance" building blocks of the 2000 CALFED plan until such time as studies and reports of individual islands and waterways affected by the conveyance more correctly and specifically address the negative impacts to those specific islands, waterways, businesses, farms, landowners and residents.

The following maps express graphically the ongoing CALFED conveyance project pathway as originally shown on the 2000 CalFed map, and subquent maps for the regional projects to build sections of the central conveyance. How can the DSC justify allowing further conveyance construction even though the cumulative effect of these projects are still not known and the "science" used to validate the conveyance projects is greatly flawed? While we're all discussing and reviewing, the building goes on apparently with or without DSC or legislative approval:

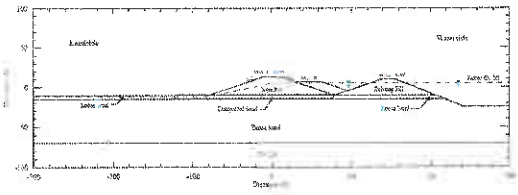


ation Boating Needs Assessment

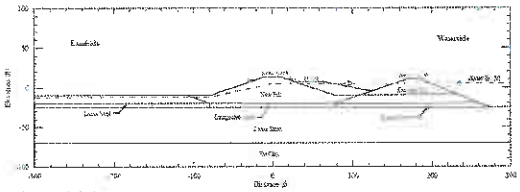
Go to the link shown within the map above for the CALFED Preferred Alternative Plan

Typical Cross Sections

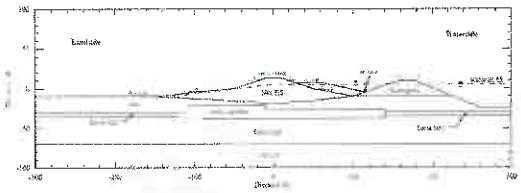
(1) No peat

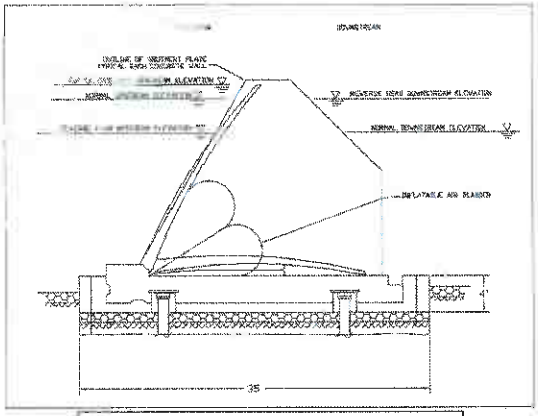


(2) 10-foot-thick peat



(3) 20-foot-thick peat





Typical Barrier Gate

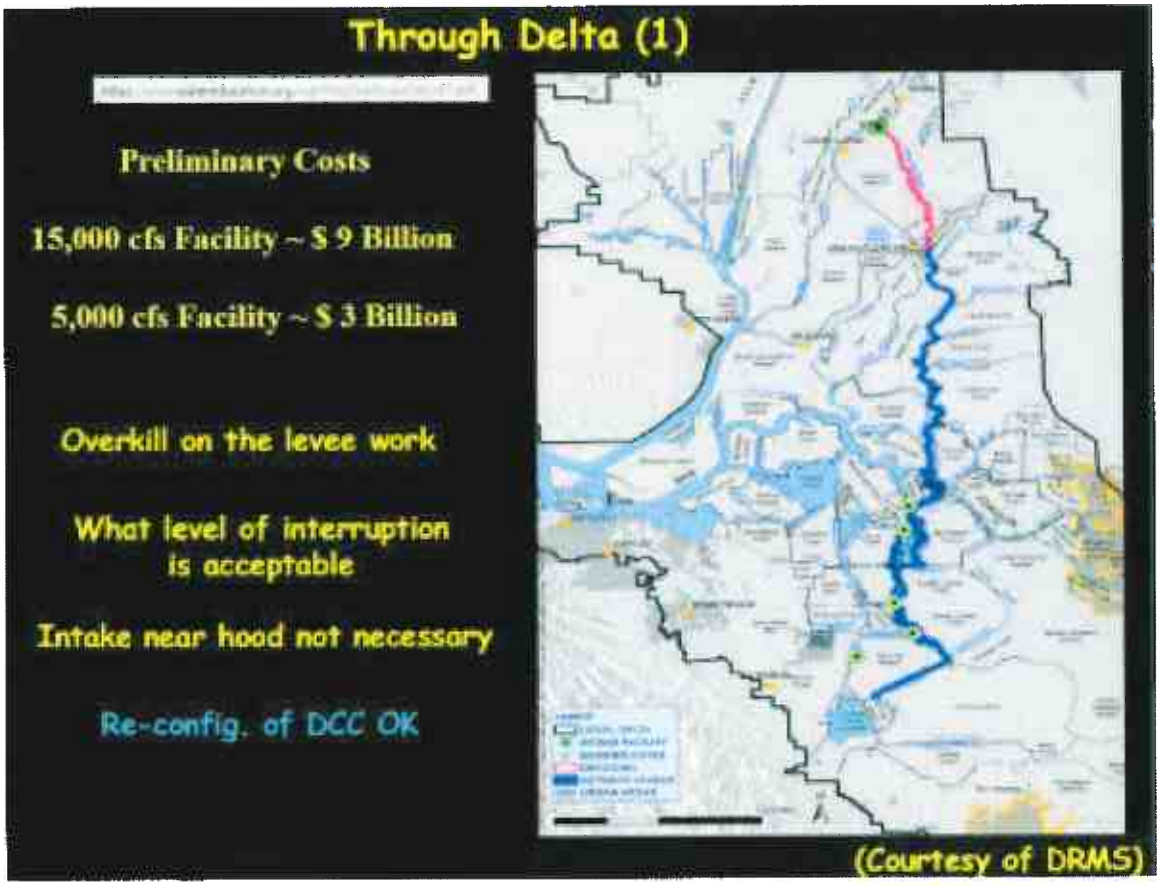
PROJECT INFORMATION
- Capacity = 15,000 cfs
- Corridor Length = 48 miles
- Set Back Levees = 115 miles
- Barrier Gates = 5

PROJECT BENEFITS
- Keeps Salinity Levels Low
- Maintains Water Quality
- Maintains Water Supply Reliability
- Protects Agricultural Areas Adjacent to Improved Levees
- Fish Screens Protect Fish
- Increases Habitat Area in Riparian Zones
- Seismic Resistant Levees

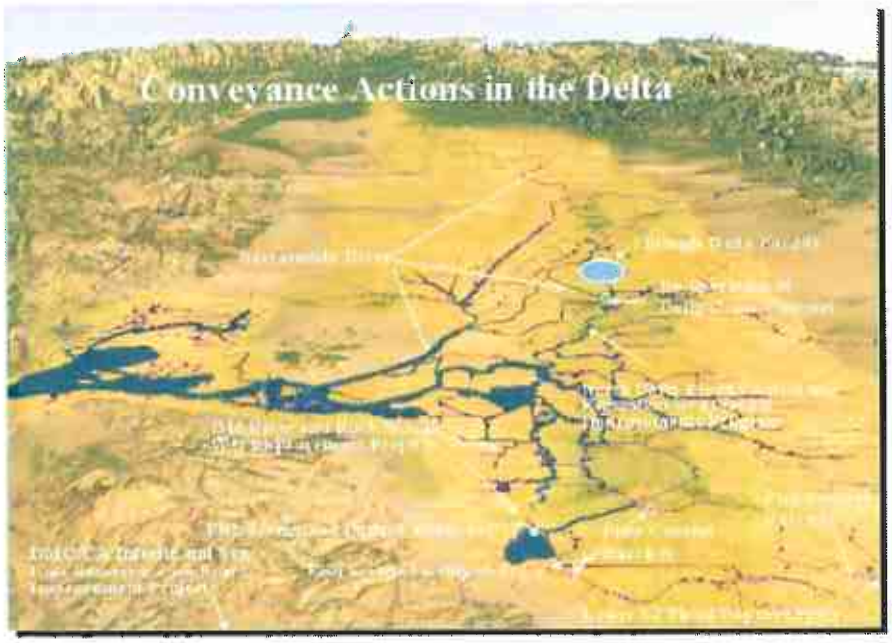
AVOIDED ECONOMIC COSTS DUE TO LOSS OF WATER EXPORTS
- Delta Agriculture Losses Due to Water Quality Degradation = $40M
- Losses Due to Water Supply Disruption to Agriculture = $139M
- Losses Due to Water Supply Disruption to Urban Water Users = $16.4B

AVOIDED ECONOMIC IMPACTS DUE TO REDUCED WATER SUPPLIES
- Agricultural Water Users Impact = $10.3B
- Urban Water users Impact = $277B

PROJECT COST
(15,000 CFS) = $9.8B


Through Delta (1)
Preliminary Costs
15,000 cfs Facility ~ $ 9 Billion
5,000 cfs Facility ~ $ 3 Billion
Overkill on the levee work
What level of interruption is acceptable
Intake near hood not necessary
Re-config. of DCC OK
(Courtesy of DRMS)

Project Map


Conveyance Actions in the Delta

Thank you in advance for your time and attention to my concerns and questions regarding plans for the Sacramento-San Joaquin Delta in general, Steamboat Slough and Ryer Island in particular.

Respectfully submitted,

Nicole S. Suard, Esq., Managing Member, Snug Harbor Resorts, LLC